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ART. XLVII.—INTRODUCTORY LECTURE DELIVERED IN THE CHEMICAL HALL OF THE UNIVERSITY OF MARYLAND, October 31st, 1837. By William R. Fisher, M. D., Professor of Chemistry and Pharmacy. Graduate and Associate Member of the Philadelphia College of Pharmacy.

(Communicated for the American Journal of Pharmacy.)

Gentlemen:—

Called, unexpectedly, by the appointing power to which the interests of this institution are confided, to discharge the duties of the chair of Chemistry and Pharmacy; and introduced suddenly from the walks of private life to a station in which the incumbent is required to announce phenomena and facts which have engaged the attention and occupied the labors, of a Thenard, a Berzelius, and a Davy; and to expound the principles, which the sagacious minds of these distinguished masters of the science have drawn from the classification and arrangement of these facts, it may be naturally imagined that I approach this chair with mingled feelings of awe and diffidence—of awe inspired by the sublimity and perfection of nature's works, as exhibited by their demonstrations; and of diffidence of my own ability to follow where they have led. The path which they have pointed out for

their successors, though defined and regular its course, and ornamented with the beauties of order, simplicity, and harmony, is yet steep in its ascent; and the traveller who fain would pursue it, is limited in his rambles and restricted in his journey by the exact and unerring rules of demonstration.—No brilliant hypotheses may captivate his fancy; no creatures of imagination are allowed to people his domain; he is bound, with the exactness of mathematical science, to the observance of facts, and is compelled at every footstep to regard with undeviating precision the landmarks which bound his track. His pilgrimage is soothed, however, by the knowledge, that every fact he acquires is one that may be subsequently available in explanation of some apparent novelty; and that this fund of information when once obtained, will be of essential advantage to him, through whatever walk of life his course may be subsequently directed: for the science which this Chair is especially called upon to teach, mingles its observations and researches with the most humble as well as the most exalted conditions and operations of either human or natural creation. It regards with interest the domestic operations of the matron, in the preparations for her daily food; as well as penetrates with a piercing inquiry into the crater of the volcano, the vast crucible of nature herself; and it finds upon reducing the contents of this great laboratory to their simplest elements, that they compare in identity with the elements which constitute the insignificant material upon which that matron exercises her culinary skill.

Great, however, as may be the diffidence which attends my introduction to this hall, and humble as may be my efforts to give interest to the themes which have occupied the illustrious names already mentioned, so inspiring is the subject itself, that, divested of all artificial aid, its principles and phenomena conveyed to the hearer in the most plain and unpretending style, must win his regard, captivate his feelings, and secure his affections.

Satisfied, then, that the merits of the subject must command attention, I enter on the discharge of the duties of the Chair

with the less reluctance, and pledge myself to bring to its support an industrious, enthusiastic attachment for the science.

The sciences of Chemistry and Pharmacy, have universally been held of primary importance in the education of an accomplished physician, but they have unfortunately been regarded by society at large as limited in their operation, to the wants of that profession. Ignorant of the benefits which have daily accrued to their comfort and health, from the skilful administration and exercise of these sciences, mankind have suffered their knowledge of them to sleep in obscurity, in a period of unusual thirst after knowledge, and been satisfied to learn that these subjects received a degree of attention from those who cultivated the healing art. We think, however, it may be shown that every member of the community has more or less interest in these too commonly estimated abstruse studies; and, remote as they seem to be from domestic happiness, that they are nearly allied to it.

The material which gives its hue to the fabric that decorates the fairest of creation's works; the application of fuel, and the mode of applying it for household purposes; the investigation and improvement of the manufacture of bread and soap, all owe their existence to the display of affinities ascertained by chemical philosophers, and must derive their improvement and consequent perfection from a regard to the principles ascertained and promulgated by them. When Sir Humphrey Davy found thousands of his fellow creatures perishing from the explosion of fire-damp, in the deep, dark recesses of the mine, and contrived the ingenious apparatus which would, for ever after, shield them from its pernicious and devastating effects, no chance came to his aid to direct him in its construction. Certain well established and demonstrable principles were endowed by him with a local habitation in the safety-lamp, and his name became identified with the instrument destined to prove a powerful philanthropic agent in arresting misery and averting death, from the head of many a helpless fellow creature. No less distinguished for the adaptation of chemical principles to the wants and comforts of mankind, was the in-

vention of the electric conductors, by our own FRANKLIN, by which the destroying bolt was arrested in its course, and diverted through a channel in which its energies became confined, and were rendered powerless.

These facts, when dwelt upon, are calculated to arrest the mind of the observer, and to induce him to regard with interest, subjects which he may have previously considered as entirely abstract and unconnected with himself; but let him proceed from these, and follow in his mind the various tradesmen and artificers, in the pursuit of their daily toil, and he will scarce fail to discover in each some application of chemical science, by which their labours are accomplished, or the product of their hands improved.

In extracting and reducing the metals from their natural combinations, or ores, so that they may resume their individual properties of malleability, ductility, and tenacity, chemistry has rendered an aid to mechanical science, without which it could scarcely have had an existence. The agriculturist who improves his lands, and is enabled to renew their vigor when exhausted by repeated cultivation, is equally indebted to chemistry, for a knowledge of the materials of which his soil is composed,—in what it is deficient, and how that deficiency may be supplied. The navigator has been taught, by the inductions of chemical philosophy, how the copper sheathing with which his vessel is protected may be rendered and preserved bright; and a powerful mechanical agency has recently been put in motion, which, from the representation of those who have witnessed its operations, bids fair to rival the expansive force of steam itself,—owing its development and even existence to the investigations and experiments of chemists. Chemistry has shown that the simple immersion of two metallic surfaces in a weak acid solution, generates a heat that has been found capable of fusing the hardest substances, and of causing the combustion of platina itself, one of the most fixed of all the metals; that the same simple combination, reduced in size, and immersed in a weaker solution, gives out an energy, that when properly applied, creates a magnetic force requiring a powerful exertion to overcome

it, capable of sustaining tons in weight; and the steam engine itself, that mighty agent, giving to man the power of a giant, was incomplete, and would probably have been abandoned, had not the genius of WATT applied the means of suddenly depriving the steam of all its expansive power, by the adoption of a simple contrivance, to which he was directed by a knowledge of the fact, that this expansive power was due to the latent heat within it, as likewise discovered and taught by the celebrated BLACK, Professor of Chemistry at Edinburg.

Who that has enjoyed the security and comfort derived from the brilliantly illuminated streets of a city, when he is told that the production of the elastic fluid, which is consumed to afford the lamp that lights his path, could never have been accomplished without the aid of chemistry, can withhold from that science the character which I claim for her, of being intimately connected with domestic comfort and happiness?

The consideration and examination of all these facts, is calculated to show the importance of a knowledge of chemistry in promoting, and creating a thousand conveniences, which characterize civilized society, and of winning for her devotees the respect and veneration of all who are made acquainted with her advantages and allurements. But when applied to the relief of suffering humanity, exhausted on the bed of sickness, or prostrate from the maddening influence of pain, bereft of reason, through disease, or burning with the heats of fever, then, indeed, is chemistry a ministering angel.

Who that has enjoyed the delights of calm repose, obtained through the aid of anodynes, after days and nights of sleepless wretchedness; who that has allayed the parching thirst of fever, and experienced the relief afforded by the effervescing draught, has ever dreamed of awarding to chemistry her full share of credit for the relief thus opportunely obtained?

It is by recounting some of these facts, and apprising you of their existence, that I trust to be enabled to show you how great have been the contributions of chemical science to the supply of your different wants, and the alleviation of your sufferings, and to convince you how essential is a knowledge of its

principles to every member of society, more especially to those who have the preservation or restoration of the health of that society in their charge.

From every source capable of furnishing information or yielding products available to the use of man, chemistry has drawn her resources; and, in her estimation, the most apparently worthless substance is held with a regard equal to that with which she appreciates the diamond. In her eyes they are both regarded as elements employed in the formation of the material world, whose characters and properties it is her province to investigate; whose affinities she is called upon to discover and record, and whose combinations possess an interest in proportion as they manifest more or less intricacy and harmony. To her view

> "All are but parts of one superior whole,
> Whose body nature is—and God the soul."

Strange as it may appear, and unexpected as may be the enunciation, the fact is nevertheless true which chemistry has ascertained, that in the fabrication of the vast universe by which we are surrounded, and of which we form so insignificant a portion, nature has employed but fifty-one or fifty-two elementary substances; and that all the various forms under which matter presents itself to us, owe their existence to the infinite variety of combinations of these elements among each other. The material composition of the body of man, the lord of the creation, is precisely identical with that of the flowers of the field and the stones of the quarry; each containing in its due proportion the elementary bodies known as oxygen, hydrogen, nitrogen and carbon, united with other substances necessary to produce and sustain its structure, or in other words, to endow it with its appropriate form.

The beautiful system of laws regulating and controlling all the combinations, developed by the chemical philosophers of the present century, exhibit the prevalence of the most perfect order and symmetry in the formation of all the compounds of which the universe is composed. Rough and misshapen as the form may be, in which many an aggregate presents itself

to us, yet in its interior arrangement, in the manner and proportion in which its integrant particles are united, there is as much symmetry, harmony, and regularity of proportion, as in the most finished architectural structure that art can design or erect.

How great, then, must be the interest inspired by the study of a science, which is capable of unfolding the beauty and regularity concealed in the rugged mass of granite lying in the quarry; and with what intense anxiety must the experimenter watch a process that is about to develope some new revelation of an unknown reality, crowning, perhaps, the pyramid which he has erected upon the basis of observations acquired during years of previous toil! Numerous are the instances in which a general principle has required a century for its development. Facts have accumulated upon facts, and been regarded as mere isolated entities, until a master spirit has arisen, at whose command they have all arranged themselves in order; apparent incongruities reconciled themselves, and a law whose existence has been coeval with the creation of the world, been adduced, to the astonishment of those who had never conceived the possibility of its existence.

The discovery of the laws regulating the formation of compounds from their simple elements, was of this character. Various facts respecting compound substances had been observed and recorded; speculations had been entered into respecting the causes of the phenomena observed; additional facts were accumulated, when soon after the commencement of the present century, the genius of DALTON conceived the idea of arranging all these phenomena, and deducing from them the circumstances under which they were exhibited; happily for the science, his effort was successful. He succeeded in demonstrating, that these combinations were perfect harmony and order themselves; that the measure of their proportions could easily be ascertained, and that when ascertained, could be applied as the measure of all future combinations of the same elements.

A Saxon chemist had previously shown the positive identity

of every compound in which the same elements were united in the same proportions, and this fact formed the basis of DALTON's theory, not to say the basis of the science itself. The discovery of this law puts the whole material world within the grasp of the chemist, and enables him to describe the structure and composition of a whole aggregate, forming, perhaps, a mountain chain, from the bare examination of minute and inconsiderable fragments. Aided by a knowledge of the affinities which one element has for all others, no composition is so complex as to bid defiance to his powers to separate and discover its integral components; and when his task is completed, he is satisfied that he possesses a knowledge of the composition of that body, wherever existing, in whatever form, or under whatever latitude it may be found; whether beneath the frozen skies of the artic circle, or fanned by the orange-groves of tropical climes.

These facts are referred to, to show, that in the investigation and discovery of the materials of which the surface of the earth is composed, no ordinary degree of intellect is required deliberately to weigh, and compare, causes and effects, phenomena and their attendant circumstances; and that no mind, however superior in its endowments, can conceive its powers misused or misapplied, when devoted to such a cause as the pursuits of chemistry are thus shown to be.

It is my purpose now to recal your attention from this stupendous fabric, an appellation to which I consider the science honestly entitled; and from the regard of its application to the development of the structure of immense masses, to direct you to some of its humbler duties, wherein its utility is no less apparent, nor less conducive to the happiness and health of mankind. The science of PHARMACY, which may be considered as embraced in this sphere of its operations, is one to which too little attention has hitherto been paid. Exceedingly humble and unpretending in its details, its operations are as closely identified with the well being of society, as those of any other profession; but the few splendors attendant on its successful cultivation, have as yet proved not sufficiently

alluring to induce the entrance into its ranks of many competitors for the simple rewards which it has to offer; consequently, public attention has, in this country, not been sufficiently awakened to an idea of its importance, and influence on the comforts of society.

It is the offspring of civilization, and can only exist in highly civilized communities: like the great science of medicine itself, of which it constitutes a no unimportant branch, the application of fixed principles for its practice, was, during the early ages of barbarism, entirely neglected and unnoticed. The savage in his native wilds, was satisfied with the application of a few bruised simples to a wound produced in the conflict or the chase, or in the administration of some simple infusion or tea, to assuage the paroxysm of fever. Beyond this culling of simples, he neither knew, nor cared, nor indeed was there probably occasion, for all the remedies which have since been introduced to our notice. In that primitive condition of existence, disease much less frequently manifested her powers; and the few ills which did afflict humanity, were perhaps capable of being relieved by these simple agents. But, as population increased, and civilization advanced, remedies were required which exceeded in complexity the bruised herbs and infusions of the early ages; and from the employment of vegetables alone as remedial agents, recourse was had to the mineral substances also provided by nature for our use. In the application of these to the wants of society, chemistry was called in to bestow her aid, and many of the preparations at present of established reputation in medicine, were the results of processes invented and pursued hundreds of years ago. At that period chemistry itself was but little better than empiricism; and adventitious circumstances attending the production of some compounds, were supposed seriously to influence their effect; while from a want of the knowledge of principles which have since been discovered, many important requisitions for their production and efficacy were entirely neglected and disregarded. Chemistry, however, was making rapid advances to the character of a sys-

tematic science, and along with her improvement was a corresponding amendment in the remedial agencies put at the disposal of the physician; and with the perfection which chemistry has now attained, perhaps, all the advantages to be derived from this application of her principles and precepts, are realized. But the extension of these has now become so general, and the importance of a thorough knowledge of their application become so great, that the cultivation of these laws, and their use in the preparation of medicines, has, in the division of labor which characterizes civilization, been erected into a separate science, and this is entitled PHARMACY. Its name is taken from the Greek word Φαρμηκον, signifying a medicine, and its operations consist in investigating the physical and chemical properties of substances used in medicine; in selecting those parts of vegetables, and preparing those compounds of minerals, which are best endowed with remedial powers; in so modifying their natural form, as shall render their powers most available when required for use; and finally, in discovering all those circumstances by which their powers may be impaired or improved. To undertake a conscientious discharge of duties so important requires an education far above the common standard; a thorough knowledge of chemistry; an acquaintance with botany, and an inflexible honesty of purpose, which will suffer no prospect of pecuniary advantage to arrest for a moment a strict discharge of all these duties with fidelity.

Great as is the dependence of the invalid on the skill and judgment of his medical attendant, for a correct diagnosis of his complaint and subsequent advice, as to the remedial agents necessary for him to have recourse to, equally great is his dependence on the honesty, skill and abilities of the pharmaceutist, to whom is intrusted the preparation and dispensation of those means which have been indicated by the physician, as essential to his relief and recovery. Should the remedies which are furnished on the physician's requisition, have become inert through age, or been impaired by a want of proper skill in their preparation; should, as has unfortunately too frequently occurred, one sub-

stance be furnished for another; should a greedy desire for gain, induce the supply of a medicine inferior from any cause, the health of the patient may receive a shock, from the effects of which the skill of the ablest physician may be unable to save him.

The importance which is attached to a proper exercise of this profession, and the high degree of responsibility involved in its functions, have induced all the governments of Europe to prevent, by the enactment of strict penal laws, any of these abuses which might otherwise have crept into it. The education of their pharmaceutists, is required to be carried to a high degree of attainment; boards of examination are established to prevent incompetent persons from intruding their services on the community, and censors are appointed whose duty it is to make a thorough examination and inspection of all the medicines submitted for sale or dispensation. Such as are found impure, deteriorated, or improperly prepared, are immediately confiscated, and a penalty is inflicted on the delinquent, besides the ignominy which attaches to a public exposure of his disgrace.

In some of the German cities, but a limited number of pharmaceutists are allowed to dispense medicines, and the inducement to enter into a competition, which may deteriorate their materials for the sake of enhancing their profits being thus removed, the only incentive remaining is, to attract employment by the offer to furnish the best supplies. In France, the same scrupulous regard is paid to the cultivation of a proper knowledge of pharmacy; and although the number of those who may practise this art is not limited by law, as is the case in Germany; yet numerous regulations exist designed to promote the interests of the profession, secure the rights and health of society, and to elevate the character of the profession by requiring from its members a thorough education in every department of science, allied in the least degree with pharmacy.

Unfortunately for the profession in this country, the law takes no cognizance of its character or duties. The

spirit of our institutions is averse to the establishment of privileged orders, and although the advantages would be decidedly in favor of that community, which was protected by the enactment of wholesome laws, prescribing the regulations under which this science should be practised, yet the conferring of an exclusive right to prepare and dispense medicines on those who alone are qualified for it, would be regarded as creating a monopoly for the benefit of a favored few. The spirit of open competition is allowed to run riot through the land, even in the exercise of a profession requiring equal skill, and a knowledge almost co-extensive with that expected in the education of a physician, and the health and lives of the community are exposed to the chances of frequent detriment, from the consequences which may result from an incompetent or ignorant discharge of the duties of a pharmaceutist. Poisons are openly and undisguisedly furnished to children and servants without fear or restraint, and no kind of inspection is practiced to determine officially that the medicines administered on the requisition of a physician, are either perfect of their kind, or prepared according to acknowledged authority. Is it not a strange, not to say a negligent oversight, that legislators should direct a careful investigation into the quality of the most common articles of merchandize, and yet suffer agents employed in the refined and delicate operations of medical practice, to pass without notice? And that the means of procuring the lasting illness or painful death of a valued member of a family, should be suffered to be dealt out without restraint, while the public press resounds with indignation at the practice of wearing weapons about the person? An open evident means of destroying life, against which the assaulted person may raise an arm in self-defence, arouses the clamors, and excites the interests of the whole community, while the silent, stealthy, insidious venom, against the operation of which no care can guard, no caution escape, no skill avert, may be instilled into the cup of festivity, or mingled with the food which hospitality provides, without any legal enactment

to put it beyond the reach of the demoniacal spirit disposed to avail itself of its powers.

The importance of a regard to the prevention of this abuse to which society is constantly exposed, has been forcibly and fatally illustrated by a case which has occurred within the observation of several of my auditors, since the preceding reflections were written. A member of a family has been laid a victim, to the habit of employing arsenic for the purpose of killing rats. Had the proper police regulations existed on this subject, which obtain in all other countries, the helpless sufferer might have been still in existence, about commencing a life of usefulness; and the unfortunate cause of the accident have been spared the remorse which must attend the consciousness of having unintentionally caused the death of a fellow creature.

Society has no idea of the many risks encountered, nor of the many evils to which it is exposed, from the want of a proper regard to legislative restrictions on the practice of this profession. Nor has it a competent idea of the importance of encouraging a class of well educated, skilful manipulators in this department of the social economy.

To illustrate the character which this science has acquired abroad, and the high standing which its adepts occupy, I desire to call your attention to the annexed extract, which is taken from a remonstrance by the Pharmaceutists of Paris, addressed to the Chamber of Deputies, on the occasion of some abuses having crept into the profession. "The knowledge," say they, "which pharmacy requires, without being as extensive, is in part the same as that which is necessary to the physician. It is as various, and is sufficiently useful to entitle him who possesses it to the particular protection of government, and to general respect. The pharmaceutists enrol in their number men of distinguished learning, who belong to the most celebrated academies, skilful professors who fill the chairs of chemistry and natural history, writers whose works are sought for in France and abroad, respectable citizens whose public services have been rewarded by honours, titles and

decorations." To enumerate the names of VAUQUELIN, PELLETIER, ROBIQUET, HENRI, PLANCHE, and VIREY, is to justiy, to its fullest extent, this warm eulogium on the characters of those who have cultivated pharmacy in France.

Alas for our native land, she has no list of worthies to compare with those enumerated; nor, indeed, with hundreds of others less distinguished in the annals of fame. "The particular protection of government and general respect," have, on her soil, offered no incentives to men of genius and education to engage their services in the profession, which abroad has won "titles, honours and decorations," and provided chairs of distinction for its disciples.

The only improvements which have arisen in this country, have been the result of voluntary, spontaneous efforts on the part of the pharmaceutists themselves. Ashamed of the condition in which their profession existed, and stimulated to the exertion of rendering themselves and pupils better qualified to minister to the wants of society, means have been adopted which, though slow and gradual in their inception, have taken deep root in the soil, and must, at no very remote period, yield a harvest that will amaze by its productiveness, and will nourish by its excellence, those districts in which its growth and maturity have been attained unnoticed. A sentiment of honest pride arouses itself within me, while thus acknowledging the warmth of my attachment for the science of pharmacy; and I reflect with lively satisfaction upon the honors now, for the first time, bestowed on a graduate of an American College of Pharmacy, in the person of the present incumbent of this Chair. It bespeaks an era about to commence, in which pharmacy will receive her due share of protection, and the general respect of the community; when her votaries will no longer be regarded as mere venders of medicines, and when she will receive her proper location among the liberal professions.

Having indulged in these encomiums on pharmacy, and introduced the evidence of the French Society to assert the claim of that science to notice and cultivation, I feel bound to

show that my encomiums have not been misplaced, nor that the respectable representatives of the Paris Society have over estimated their own importance or utility. To prepare and dispense with propriety and ability, the medicines required for the renovation of health; to study their chemical and physical properties, so that the good may be distinguished from the bad, and the perfect from the imperfect; to devote a life to the study which is requisite to keep pace with the rapid advance of knowledge of this age; and to discharge, honestly and faithfully, their duties to their compeers and the medical profession, should, in my opinion, qualify those who do discharge these several duties, and do possess these requirements, to as high a regard in the estimation of the public, as any other class of society is entitled to. And here I might rest their claims; but I found their demands to respect and protection on specific benefits which have been conferred by the science, which, when enumerated, will, I think, justify what has been said.

The advantages to be derived by society from the uniform and defined preparation of medicines, furnished to the sick in precisely such form and activity as is prescribed by the physician, (not the least conspicuous among the benefits derived from pharmacy,) are sufficiently obvious to impress upon the mind some share of her claims. But independent of that, which is doing no more than pharmacy acknowledges as a duty, for the discharge of which she asks no favours, I will point with satisfaction to the discovery and application of the chlorides of lime and soda as disinfecting agents, which constant domestic use has now familarized to every household; and which have become as necessary aids in promoting cleanliness and comfort, as the use of any of the agents habitually applied to that purpose. In their uses as medicines, the practitioner of medicine will admit the many important benefits derived from them; and the helpless sufferers who have been relieved from the pains and disgusting attendants upon a class of diseases by no means unfrequent, or uncommon—a class for whose relief, these remedies appear to have been almost especially provided—bear me witness to their efficacy and utility.

These chlorides have procured health and comfort for the inmates of crowded ships, and dispelled the apprehension of a disease among them in tropical climates, at whose approach the stoutest stood aghast, and reflecting on the prospect of death, may be imagined to have uttered,

> "Take any shape but *that*, and my firm nerves
> Shall never tremble."

The discovery and perfection of the process employed for producing these compounds, was the result of the skill and intelligence of a pharmaceutist of France, LABARRAQUE, whose name has become celebrated from having been identified with these substances which his science and industry introduced to the notice of the medical profession, and to the domestic use of society at large.

The discovery, by analysis, of the composition of vegetable substances, and the determining of the fact that their remedial powers resided in an active principle, capable of separation from the great bulk of woody fibre in which it was enveloped, was the result of pharmaceutic enterprise and talent.

This discovery has opened a new branch of science for the labours of the present generation, and has materially changed the therapeutic system as formerly established and taught. The system of the patient is no longer overloaded with an immense amount of inert matter, in order that he may receive the benefit to be derived from an infinitely small proportion of active matter associated with it. Who that has his recollections awakened of spoonfuls of nauseous dry powder, at which the stomach revolted, forced upon him in the shape of bark, can withhold from pharmacy the merit she claims of having separated from that same bark the beautifully crystallized element which gave it all its powers, and which was capable of producing in a dose "in shape no bigger than an agate stone," all the beneficial effects for which the bark had long been celebrated. In many cases it so happened that a vegetable provided by nature with a principle which gave it an ability to do good, was, at the same time, invested with

a principle to do harm, and hence its use became either altogether prohibited, or at least it was a matter of accident, whether, in particular cases, the good or bad principle might prevail in its influence on the system; of such a character is opium, so constantly and extensively employed in the practice of medicine. It is a matter of general notoriety, that the use of opium, in many cases, is utterly precluded, from the occurrence in it of two principles, as above described. The soothing, calming influence, which it is capable of exercising, being, in some constitutions, entirely overruled, and its effects counteracted by the stimulating, exciting power, with which it is also provided by nature. Pharmacy, by discovering the existence of these two principles, and designating the process by which they may be separated, has conferred an invaluable boon upon the comforts of the sick, and has provided, through the skill of the medical practitioner, the means of procuring the calm of "nature's sweet restorer," without arousing the debilitated nerves of the sufferer into a state of anxious and thrilling excitement. There is, perhaps, no more beautiful example of the operations of pharmacy, than the process of separating morphia from opium. This process it will be hereafter my duty to describe and explain; at present, a bare allusion to it is all that is in my power.

The separation of quinia from bark, morphia from opium, strychnia from nux vomica, and, indeed, of numerous other active principles, has led to the introduction of a new mode of administering medicines, in which the patient is spared the fatigue and nausea attending the ordinary practice of swallowing his dose. By a process termed the *endermic* mode, these active principles are introduced into the system, and their effects are manifested just as when taken into the stomach; according to this mode they are applied either in the form of an ointment, or dry powder sprinkled over a small spot from which the skin has been removed by the action of a blister; and, in some diseases, more success has attended the endermic method of treatment than that formerly pursued. It enables the action of the medicine to manifest itself directly

upon the diseased part, and of course is more rapid in its effects than when compelled to travel the whole circuit of the circulation before reaching that part which requires its aid.

One of the chief advantages which attends our knowledge of the presence of these active principles in vegetable remedies, and of the means by which they may be separated, is, that we are at once furnished with a prompt and certain mode of ascertaining the qualities of vegetable medicines. For since it has been proved that all owe their efficacy to the presence of some one of these, it is evident that their powers are in direct proportion to the amount of the active principle which they are found capable of furnishing. Hence, in making choice from different portions of opium, in order to select that which is best, we naturally prefer that which produces the largest amount of morphia; the same reasoning will apply to bark from which the separation of quinia forms the criterion by which the judgment is formed; and the quantity of atropine, or hyoscyamine, obtained from the plants in which these principles exist, enables us to decide whether the leaves which furnish them, are entitled or not to our confidence.

In a word, Pharmacy has applied to vegetable substances the same unerring test for estimating their value to which general chemistry had already subjected mineral bodies. The amount per cent. which may be yielded, in both cases, being the direct measure of their value. This object is, alone, one of primary importance, and cannot too often be made available in the successful prosecution of the duties of a pharmaceutist and physician.

But Pharmacy has by no means limited her investigations to those which have been announced; she has directed her attention to the improvement of the processes by which the extractive matter of plants is removed from them and converted into a form, by which its efficacy is preserved unimpaired, and may be employed long after the plant which furnished it has mingled with the dust. She has discovered and invented hundreds of modes by which the form of medi-

cines has been improved, and has simplified formulæ applying to their construction the beautiful and systematic proportions developed by the laws of combination.

I have now, I trust, made out a case proving to your satisfaction, that Pharmacy is equally worthy the cultivation of enlightened minds, with her parent Chemistry; and, I trust, that with the medical class certainly, if with no other portion of my auditors, no further comment will be required to invite an enthusiastic devotion to the course of study, required to embue their minds with her principles, and familiarize their hands with her practice.

Situated as the large body of the practitioners of medicine are in this country, in remote situations, beyond the reach of those who make pharmacy a distinct object of study, it is incumbent on them to possess such a knowledge of that science as will qualify them to judge of the quality of their raw materials, and enable them to prepare the officinal and magisterial formulæ, required for the relief of their patients. They cannot place too high a value on this department of their education; for no one can realize the importance which may attach to the purity of a vegetable powder, or the unimpaired strength of a blister. Employed at a moment when the contest between disease and vitality has brought the fluttering soul almost to the period of dissolution from her material abode; when anxious friends and distressed relatives look with intense anxiety to the effect of every remedial means employed, the impurity of a medicine administered in a minute dose, or the failure of a blister carelessly or inefficiently prepared, may decide the contest between life and death; and, with the liberated soul of the departed friend, may vanish all confidence in the skill of the physician. How awful, then, the consequences which attend the preparation and administration of medicines to the sick, and how high are the responsibilities assumed by those who undertake their preparation and direct their use;—a career of distinguished reputation just dawning on the young aspirant for medical honour, may be suddenly arrested, and all his prospects

destroyed, by the failure of any of his remedial means through inefficiency or impurity.

The consideration of these responsibilities, and of the means by which the risk of their being brought home upon you for redemption may be avoided, is an important subject for reflection; and I think I do not magnify the importance of it, when I address these appeals to your understandings and feelings. It shall be a constant object of solicitude with me, while I have the honour to hold this Chair, to maintain, with what ability I possess, the importance of a thorough knowledge of Pharmacy, as a branch of medical science, and a requisite in medical education; and I shall endeavour to present its details in such an aspect, during the course which is to follow, as will, at least, enable you to appreciate their value and qualify you for their practice.

To obtain a thorough knowledge of Pharmacy, requires a knowledge of Chemistry, which is required in the formation of a medical education by various other considerations; one of the principal of which may be said to be the selection and preparation of proper antidotes to the various poisons, which may be introduced into the system, and threaten life with destruction. All proper antidotes depend upon their chemical properties for their efficacy.

Called suddenly to the bedside of the sufferer, who may be the victim of accident or design, the medical practitioner, who is perfectly familiar with laws of affinity and combination, is never at loss for an agent which will neutralize or destroy the potent energies of the substance which "pours its leprous distilment" into the system of his patient. No loss of time in the application of his remedies is to be apprehended; a cause which not unfrequently tends to the accomplishment of the effects of the poison. Calmly and philosophically he learns the name, or judges by the symptoms, of the enemy which is in deadly conflict with vitality, and possessed of a thorough knowledge of chemistry, he is at once enabled to counteract its effects by decomposing its structure, or by reducing it to such a condition as will entirely change its

character. On the other hand, he who is ignorant of the means by which these changes in its character may be effected, employs his antidotes at random, or suffers the early moments to be wasted, while he is acquiring the necessary information, during which period the agonized sufferer is gradually perishing from the power of the venom, "which shuts up sense, and o'er his inmost vitals creeping," finally overcomes by its prowess, and secures a victim, if not to ignorance and poison, at least to poison which ignorance was incapable of counteracting.

The prevention of disease is equally an important object with the physician, as its removal when formed, and a knowledge of chemistry is indispensable to the full understanding of public hygyene. The diagnosis of disease is frequently aided by chemical agencies, and there is a class of diseases in which it is almost impossible to form a correct diagnosis, without an aptitude at chemical manipulation, as well as knowledge of chemical principles and affinities. Situated remotely from the residence of practical chemists, the practitioner of medicine is frequently called upon, in courts of justice, to furnish testimony in cases involving the greatest responsibility and intricacy. The life and death of the prisoner, his acquittal or conviction, rest upon the fiat of the medical witness. How exceedingly important, then, that that witness should possess, in a thorough knowledge of chemistry, the means by which he may be enabled to pronounce his opinion with certainty, his mind unembarrassed with the reflection that he may, through ignorance, have the responsibility of an unjust verdict laid to his charge. The recent application of the galvanic fluid to the cure of disease, renders a knowedge of that subject important to a physician; and, finally, it may be said, that a complete medical education cannot be attained without extensive acquirements in the science of Chemistry.

It is deemed unnecessary to delay you longer with an enforcement of the claims which the chemical and pharmaceutical sciences have on your attention, and even on that of so-

ciety at large. Enough has been said, it is believed, to show that their operations are directly and indirectly involved in the interests and comforts of every class of the community. Their connexion, in many instances, has been pointed out, and some important results have been shown to depend upon their exercise and cultivation.

It remains, therefore, only to acknowledge the important responsibilities, which are assumed by the occupant of this Chair who has undertaken the duty of inculcating subjects fraught with so much interest and importance. The responsibilities of a public teacher, at all times deep and momentous, are in this case particularly imposing. Flattered, however, by the choice of the trustees, and encouraged by the opinions expressed by many friends who are deemed capable of advising, the present incumbent undertakes the duty with a full sense of the difficulties he is about to encounter; but trusting to your clemency as critics, and relying upon the partiality which has called him to the Chair for an indulgent regard to his fallibility, he embarks upon the extended sea, before him.—Demonstration his sheet anchor—the experience of his predecessors his pilot—your ultimate success in the attainment of Chemistry and Pharmacy, the haven to which his course is directed—and the polar star toward which all the results of his industry and solicitude centre, *the professional reputation of the* UNIVERSITY OF MARYLAND.

ART. XLVIII.—PHARMACEUTIC NOTICES. No. XIV.

By AUGUSTINE DUHAMEL.

Vinum Secalis Cornuti. Ergot is given in powder, infusion, or decoction. Our Pharmacopœia does not recognise any officinal preparation of this substance. For the purpose of administering it in an extreme state of division, and with a view to its preservation in a convenient form, it has been recommended to be given in tincture, which is commonly prepared and kept by druggists. The strength varies from one to eight in different shops.

The formula of Dr. DEWEES, by whom it was principally used, is eight ounces of ergot to a pint of rectified alcohol, with the addition of one ounce of cinnamon bark. But as the highly stimulating property of the vehicle here employed, has been in some cases found objectionable, and a better substitute suggested in the preparation of a wine imbued with its virtues, I would recommend, for the sake of uniformity, an adherence to the formula here proposed, which so far, and it has been a long time used,—has given general satisfaction.

Take of Ergot in coarse powder,	℥ij.
Teneriffe wine,	Oj.

Macerate for 14 days, and filter.

Tinctura Saponis Camphorata. The authors of the Pharmacopœia have not particularized the quality of soap to be employed in the preparation of the liquid opodeldoc. In making this liniment, in pursuance of the direction indicated by the formula of the United States Pharmacopœia,—"Take of soap, &c."—I made use of the American white soap, and the consequence was a formation of the solid opodeldoc; regarding the proportion of soap as an error, I then added a quantity of alcohol equal to that first employed, which gave me a tincture of soap, though not a permanent preparation, for being put aside, there was a constant and gradual precipitation

of stearine, which rendered it necessary to perform frequent filtration. This at once reminded me that the American soap was made with animal fat, while, if I had used the Castile soap, which is made with olive oil, the like difficulty would not have ensued.

Iodic Solutions. Mention having been frequently made to me, by physicians, of the imperfect manner generally followed in preparing LUGOL's Solution of Iodine, or their prescription of iodine and hydriodate of potassa in solution, it may be deemed advisable to remind those unaccustomed to manipulate with iodine and its preparations, that to carry into effect the desire of the physician, they must triturate the dry substances first with a few drops of water only, until the iodine is completely dissolved, and afterwards add the requisite quantity of water, instead of the common practice of throwing these ingredients into a mortar and pouring upon them the prescribed quantity of water at once; or as some do, after weighing the ingredients, put them into a vial and fill it up with water. Simple agitation in a vial, of these substances, with but a *very few drops of water*, may answer the same end; but the manner is unpharmaceutic. Unless the mode indicated be pursued, a portion of iodine will always remain undissolved.

Effervescent Magnesia. This saline aperient commonly known in connection with the name of its inventor, as "MOXON's Aperient Effervescent Magnesia," has enjoyed considerable reputation from its peculiar gratefulness to a fastidious stomach, as a remedy in Indigestion, Heartburn, Nausea, &c. The manner here indicated is that by which a preparation very similar to the original article may be made. It is the imitation of Mr. E. DURAND.

Take of Carbonate of Magnesia,		one part.
Sulphate of Magnesia,	}	of each two parts.
Bi-Carbonate of soda,		
Tartrate of Soda and Potash,		
Tartaric Acid,		

These ingredients must be perfectly dried by expelling the water of crystallization, then reduced to powder, and finally mixed together. Enclose in dry bottles, with good corks adapted to them, and seal with wax. If there be the least moisture contained in the mixture, carbonic acid will be generated, and bursting of the bottles will follow. *Dose.*—A tea spoon full in half a tumbler of water, drank in a state of effervescence.

Mother Ointment. Onguent de la Mere Thécle, so called from having been first used by an old nun of that name, and known otherwise by the terms, *Brown Plaster, Brown Ointment,* &c. is an emollient and suppurative preparation, much employed in France as an application to boils, &c. Its reputation and use there, being co-extensive with the domestic application to boils in this country, of a salve made of equal parts of brown soap, and much used in the nursery. It is thus prepared:

Take of	Olive oil,	lbs. ij.
	Semivitrified oxide of lead,	lb. i.

Put these substances in a metallic vessel over a gentle fire: mix and stir incessantly with a wooden spatula until the mixture carbonizes and assumes a dark brown colour, disengaging a thick black smoke. This stage of the operation requires particular care, as the mixture puffs up with violence, and is highly inflammable. To this add the following mixture, previously melted and strained.

Lard,	lbs. ij
Suet,	lb. j.
Yellow wax,	lb. ¾.
Black resin,	lb. ½.

When the whole is incorporated, pour the mixture into a proper mould, made by simply turning up and securing the

edges of a sheet of paper, which upon cooling will present a flat cake, which may be cut up into pieces of convenient size.

Opiates. Divers are the preparations of opium, holding, more or less, some of its various principles in solution. Among them are those, with the proportionate activity of which, we are made familiar from the almost daily habit of using them. Others there are, so rarely employed, that we cannot always recall to mind the exact quantity of opium they contain. I have arranged the following synopsis, to show at a cursory glance what is needed; and, at the same time, assist the physician in a choice of *opiates.*

Preparations.	Opium to the oz.	Quantity considered equivalent to 1 g. opium
Syrup of poppies, Lon. Dub. Ed. analogous to	1½ gr.	
Elixir Paregoric, U. S. E. D., contains	1¾ "	
" " Bateman's	2 "	
Syrup of opium, French,	2 "	
Solution of sulph. Morphiæ, 1 gr.,		80 minims.
Ammoniated tincture of opium,	8 "	60 m.
Theriaque andromaque, Fr.,	8 "	60 grs.
Confection of opium, U. S., L. D.,	14¾ "	36 grs.
Black drop, U. S.,	32 "	15 m. or 20 drops.
Laudanum, U. S., L. D. E.,	37½ "	14 m. or 28 "
Dover's powders, U. S.,	48 "	10 grs.
Wine of opium, U. S.,	60 "	8 m. or 10 "
Sydenham's laudanum,	68 "	7 m. or 20 "
Magendie's solut. Morphiæ, 16 grs.,		5 m.
Vinegar of opium, D.,	120 "	4 m. or 5 "
Rousseau's laudanum,	137 "	3½ m. or 6 "

Chloride of Zinc. This powerful escharotic has been brought into high repute lately, from the good effects experienced by its application as a cautery in cancer and ulcerous affections. It is applied by means of a moistened hair pencil.* This salt is prepared by dissolving zinc in small fragments in hydrochloric acid, and evaporating to perfect dryness; it may likewise be prepared by distilling in a retort a mixture of 100 parts of bichloride of mercury and 12.5 of granulated zinc. It

* Mixed with an equal portion of oxide of zinc or sulphate of lime.

sublimes, and is collected in the superior part of the vessel. Chloride of zinc is presented in the form of an uncrystallizable mass, of an opaque white colour, having a strong and disagreeable taste. It is deliquescent, and very fusible, from which circumstance it has received the name of *butter of zinc*. It fuses at about 100° C., becoming, upon cooling, at first viscous, then solid. At a red heat it sublimes, and when conducted in the open air its volatilization diffuses vapours of a pungent odour, having irritating properties. From its ready attraction of humidity this salt should be enclosed in well stopped bottles.

Hints to Physicians in Prescribing. To reiterate the oft urged injunction, not to neglect matters apparently trivial where human life is concerned, may come with seeming ill grace from one connected with medicine only by a knowledge of its kindred branches of Pharmacy and Chemistry, especially when addressed to those whose improved minds have embraced a wide extent of information. But some there are, whose multifarious duties render them neglectful of the minutiæ of prescribing; others from a limited knowledge of the laws of combination, prescribe chemical agents incompatible with each other, and defeat the objects they have in view; and to solicit some attention to these considerations may not be without some profit to the sick—and as concerns ourselves in a less degree, relieve us from an irksome task to which we are sometimes subjected, in the preparation of incongruous mixtures. Frequently *Muriate of Mercury* is prescribed, meaning sometimes calomel, at other times corrosive sublimate, and is put up according to the discretion of the apothecary. This should not be; errors might easily occur; the terms *mild* or *corrosive* should always be superadded, and if they are not, even in infinitesimal doses—calomel should be given unless assured otherwise. This forms but one of many instances. Mineral substances embrace such a range of combination, differing materially in their properties, that they should be particularized so as to leave no room for doubt.

With reference to the vegetable kingdom, the wines of colchicum will serve to illustrate our views: the wine of the seed is said to possess a marked difference from that of the root, yet from a general inattention to this circumstance, we are seldom led to discriminate.

With regard to manipulation, some physicians, with a proper deference to the skill of our apothecaries, direct their prescriptions to be put up *secundum artem*, while others tax our ingenuity to make a good preparation, in following their instructions. Mucilage of gum arabic affords a good exemplification. As simple as it would appear, yet there is nothing appertaining to pharmaceutic handiwork, that is attended with less success, or is so difficult to beginners, as the preparation of mucilage of gum arabic, with the view to the suspension of oils, balsams, &c. It rarely happens that the proper quantity of gum is prescribed, and not unfrequently much more than necessary, which renders it as difficult to make a fine mixture as the employment of too little gum. Sometimes half an ounce of gum, and even one ounce is directed for the suspension of four or eight drachms of copaiba in an eight ounce mixture, of which for a like quantity of mixture one drachm is sufficient, provided there be not too large a portion of spirituous preparations in the composition.

Substances are often prescribed as vehicles for the administration of some active substance, which are wholly inadequate for the purpose—for instance, camphor, strychnine, and other vegetable alkaloids, to be made into pills with crumb of bread; resinous substances with gum, and extracts with essential oils, &c. To enumerate all the inaccuracies, and to say why these are inappropriate, or what are proper substitutes, would occupy more space than the limits of this Journal would permit. These few observations, hastily embodied, are sufficient to show that our learned and respected coadjutors are liable to errors, and may remove from us the censure to which we are sometimes exposed, from the utter impossibility of making elegant preparations, according to ill directed prescriptions.

ART. XLIX.—PURIFICATION OF COTTON OIL.

THE purification of cotton oil is of such vast importance for this and the countries where the cotton plant is cultivated, that frequent endeavours have been made to render this oil useful in domestic economy, but these have invariably proved abortive, in consequence of the experimenters making use of processes employed for a long time in the clarification of certain oils of Europe, whilst the oil of cotton differs materially from all other oils. It is useless to try to purify it thoroughly. Indeed the quantity of *elaine* is so much less than the proportion of *stearine*, that it gives to this oil an almost butter-like consistence, which alone presents an obstacle to its use in affording light. Independent of this, the impure oil of cotton, such as is received from Natchez, contains a very considerable quantity of mucilage, and also carbon, which still increases its density.

After several trials, I have come to the conclusion that it is necessary to separate the *elaine* from the *stearine* to render the oil combustible; an object which can easily be attained by adding, to a given quantity of oil, a sufficiency of boiling alcohol to dissolve the greater part. Decant, and submit to distillation without awaiting its becoming cool. The alcohol always carries off from the mass a little colouring matter, which gives to the *elaine* a brownish tint, but which may be easily removed by treating it anew with alcohol, and filtering the oil through coarsely bruised animal charcoal. As to the *stearine* forming the residue, by adding certain proportions of yellow wax and plumbago, it may be used as a composition for greasing carriage wheels. It may likewise be saponified, and an impure soap made. At first sight, this process may seem costly, but it is easy to perceive that at each distillation scarcely one-tenth of the alcohol is lost. With an advantageous profit, this oil can then be passed over to commerce at a price far below that of the spermaceti oil.

Dr. JAMES TRUDEAU, of New Orleans, and latterly a resi-

dent of this city,—a young gentleman ardently devoted to scientific pursuits,—has communicated the above valuable information, which must be of exceeding interest to our cotton planters of the South.

Usually, the seed is employed only for feeding cattle, which, before the extraction of the oil, they will not eat, but the cake, after expression, they are very fond of. Hence the oil is lost, although considerable expense has been incurred in the attempt to make it serviceable, as a substitute for fish oil, in illumination. This object can be effected on a large plantation, where there are slaves, by the construction of a very simple apparatus, in connection with a still for furnishing alcohol at a comparatively trifling cost.

A. D.

ART. L.—SOME REMARKS ON THE OIL OF WILD CHERRY BARK.—By William Procter, Jr.

The science of vegetable chemistry has been making rapid advances within the present century, and though yet in its infancy, we have every reason to believe that, at no distant period, it will be reduced to fixed laws of action, as in the more perfect divisions, styled inorganic chemistry.

The recent discovery of Liebig and Wohler, of the constitution of the oil of bitter almonds, and its relation to benzoic acid, proving the existence of a compound *radical* capable of union in atomic proportions with the simple non-metallic bodies, and of being transferred from one to the other, is a brilliant example of this gradual advancement.

The analogy which exists between the sensible properties of the oil of cherry bark, and those of the oil of bitter almonds, (see *Jour. Phila. Col. Pharm.*, vol. vi.,) led me to suspect a similarity of constitution, and it was upon this conviction that the succeeding experiments were undertaken. How far

this analogy is correct, may be seen in the sequel; and I have no doubt, that time will prove that all those vegetable products of distillation in the form of oils, which hold hydrocyanic acid in solution, are alike constituted.

The oil obtained from the *bark* of the Prunus Virginiana, seems to pervade the whole plant, and to be particularly abundant in the kernels of the fruit; but owing to its association with a fixed oil, it is more difficult to isolate.

The first notice of this oil will be found in an inaugural dissertation on the Prunus Virginiana, by STEPHEN PROCTER, (see *Jour. Phila. Col. Pharm.*, vol. vi.,) the object of which appears to have been to demonstrate the presence of hydrocyanic acid.

Experiment 1.—One pound of recent wild cherry bark was submitted to distillation in a glass retort, with sufficient water to prevent empyreuma, and the operation continued until the odour of the oil ceased to be perceptible in the product. It had a milky appearance and smelt strongly of hydrocyanic acid, which, in connection with oil, it held in solution. This was returned with another pound of the bark into the retort, and again distilled; which process was repeated until six pounds of the bark were consumed, being careful to remove the oil from the bottom of the water in the receiver, each time, previous to its being decanted. This liquor was found upon examination to be strongly charged with hydrocyanic acid.

The oil, as obtained above, has a light straw colour, which becomes deeper by age, a powerful odour, resembling that of bitter almonds, and a very pungent taste. It is inflammable, and has a density of 1.061. It is slightly soluble in water, to which it communicates odour and taste, very soluble in alcohol and ether, and its alcoholic solution is rendered lactescent on the addition of water.

Its effects on the animal economy are strikingly powerful, having all the characteristics of the oil of bitter almonds. One drop of it was put upon the tongue of a cat, which pro-

duced convulsions, contortion of the spine, and, in a short time, total loss of power over the posterior parts, and great general prostration, swelling of the neck, and stiffness. These symptoms gradually passed off, and in half an hour the cat recovered, much exhausted. These are evidently some of the principle symptoms of prussic acid, as noticed in the books.

Experiment 2.—A portion of the oil of cherry bark was mixed with a compound solution of potassa and proto-chloride of iron, and briskly agitated, in order to abstract the hydrocyanic and benzoic acids from the pure oil, with which they are associated. This mixture was introduced into a retort, and heat applied, until all the oily matter passed over, together with some water. The contents of the receiver was then mixed with half its weight of dry carbonate of potassa, and again submitted to distillation. The product was perfectly transparent and colourless, but was associated with a little water, which was highly charged with it, and from which it was afterwards entirely separated. This oil is more limpid than the original, does not darken by age, has a specific gravity of 1.046, has the odour of the original oil, (though not so intense,) and a burning aromatic taste. It is partially soluble in water, very soluble in alcohol and ether, and from its solutions in these latter is precipitated by water. When suddenly heated in an open vessel, or what is better, when dropped on iron heated nearly to redness, it inflames, and gives off much carbonaceous matter, but it may be passed through a red hot glass tube without decomposition, condensing in its original form.

From the above description, it may readily be seen that the purified oil of the Prunus Virginiana, is *identical* with the hyduret of benzule, (purified oil of bitter almonds,) of Liebig and Wohler,* which is constituted of a peculiar compound radical called benzule, whose symbol is Bz., and hydrogen.

* An. de Ch. et du Ph., vol. li., p. 273, &c.

Atoms.

Thus Carbon $14 \times 6.12 = 85.68$ C. } 106 68 Bz. + 1 Hyd. = 107.68
Hyd. $5 \times 1. = 5.$ H. } Hyd. Bz. yields 1 eq. Hyduret
Oxyg. $2 \times 8. = 16.$ O. } of Bz.

Experiment 3.—The purified oil (Hyd. Bz.) was heated with an equivalent quantity of hydrate of potassa, and a little water, until it was entirely taken up. Upon evaporating this solution, crystals having the characteristics of benzoate of potassa, were obtained. The re-action here is such that the water of the hydrate yields oxygen to the benzule to form benzoic acid, which then unites with the potassa, and two equivalents of hydrogen are liberated.

Experiment 4.—A portion of hyduret of benzule in a glass capsule was suspended in an atmosphere of oxygen. At the end of twelve hours crystals were perceptible, and by further exposure the whole mass crystallized and lost its odour of bitter almonds. The re-action here was such, that the hydrogen and benzule severally absorbed an atom of oxygen forming water and benzoic acid, which combined to form one equivalent of crystallized benzoic acid.

Nitric acid does not dissolve hyduret of benzule cold; but by a gentle heat it is readily taken up, and deposited on cooling. If the heat be carried too high, decomposition takes place, and deut-oxide of nitrogen is evolved.

The pure oil of wild cherry bark, by exposure to the air, is converted into crystallized benzoic acid by the absorption of two atoms of oxygen.

The last two experiments are almost a repetition of LIEBIG and WOHLER'S, and very decisively mark the constitution of this oil; and it is to its ready absorbtion of oxygen, that the presence of benzoic acid is due in the original product.

Experiment 5.—Oil of wild cherry bark (as above) was introduced into a small glass retort, and a bent tube inserted tightly through the tubulure, with the other end attached to a vessel in which chlorine was generated. Upon displacing the atmospheric air in the retort, by chlorine, the oil rapidly absorbed the latter, increased in temperature, and evolved

hydrochloric acid gas, which was formed by the union of chlorine with the hydrogen of the oil. The resulting liquid had a yellow colour, owing to the presence of free chlorine, which, upon the application of heat, regained its colourless appearance. This compound has a very irritating odour, affects the eyes, and has a very pungent taste. It is readily soluble in alcohol and ether, and its density is between 1.9 and 2. Its boiling point is quite elevated.

If, when this compound is at its boiling point, small pieces of sulphur be dropped into it, they continue to be dissolved until one-fourth of the weight of the liquid is taken up. Upon cooling, the sulphur is deposited in minute crystals. During the action of chlorine on hyduret of benzule, if the absorbtion be allowed to go on to saturation, a deep yellow coloured liquid results, which, after standing some hours free from exposure, becomes a mass of acicular crystals of the same colour. These fume powerfully on exposure, irritate the nose and eyes. Whether this article is a new compound,—say a bichloride, or whether it is simply a mixture of the chloride and chlorine, remains to be determined.

Experiment 6.—A portion of bromine was added to hyduret of benzule, contained in a glass vessel. The temperature of the mixture increased, and combination was effected.

By the application of heat, the free bromine and hydrobromic acid formed by the union of bromine with the hydrogen of the hyduret, were driven off; and the liquid, which was of a brown colour, became a mass of foliated crystals on cooling. This compound has a peculiar odour, different from either of its constituents, a rank pungent taste, soluble in alcohol and ether, and deposited in crystals from its solutions by evaporation.

Experiment 7.—A portion of chloride of benzule was introduced into a tube retort, and an equivalent quantity of iodide of potassium mixed with it. On heat being applied, a brown liquid passed over into the receiver, which became solid by standing. When deprived of free iodine, (according to LIEBIG and WOHLER,) it is colourless. This compound has a hot burning taste, a peculiar odour, and dissolves readily

in alcohol and ether. It is readily inflammable, and burns with a bluish flame.

Experiment 8.—A cyanuret of benzule was obtained, by distilling together a mixture of chloride of benzule and cyanuret of mercury. It is a yellow coloured liquid.

Experiment 9.—A portion of chloride of benzule was put in a small glass vessel, and ammoniacal gas, previously deprived of moisture, passed through it. The instant that the volatile alkali and chloride came in contact, the latter assumed a white colour, and presently became nearly a solid mass, which, according to LIEBIG and WOHLER, is hydrochlorate of ammonia and benzamide. By water, the former is dissolved, and the latter isolated. The quantity obtained was so small as to prevent all characteristics (as ascertained by its discoverers) from being carried out, except two, viz., that it is soluble in boiling water, and that by boiling with potassa ammonia is evolved, and benzoate of potassa is obtained by evaporation.

Benzamide differs from benzoate of ammonia only in containing one atom less of hydrogen; for it is evident that during the action of ammonia on chloride of benzule, that one equivalent of hydrogen, either of the benzule or ammonia, is necessary for the conversion of the chlorine of the chloride into hydrochloric acid, in order to form hydrochlorate of ammonia. It may, therefore, be called either a compound of benzule with dinituret of hydrogen, or of ammonia with a compound of carbon, hydrogen, and oxygen, differing from benzule in containing one atom less of hydrogen.

Its discoverers say that benzamide bears the same relation to the benzoate of ammonia, as oxamide does to oxalate of the same alkali; because the addition of one equivalent of water converts it into benzoate of ammonia.

Oxamide is formed by the decomposition of the oxalate of ammonia by heat, but benzamide cannot be thus generated, because benzoate of ammonia is a volatile salt.

That the deleterious properties of the wild cherry oil are due to hydrocyanic acid is evident, because the purified oil

(hyduret of benzule) has no sensible effect on the animal economy, other than the disgust manifested at the disagreeable taste; and, from the activity of the former, this acid must exist in considerable quantity.

From the foregoing statements, it appears evident that the oil of the Prunus Virginiana is very nearly identical with the oil of bitter almonds; for not only is this the case in its sensible and toxicological properties, but in its chemical compositions. LIEBIG and WOHLER state, that neither the oil nor its accompanying acids pre-exist in the almond; and, if not, the question arises in what state does the benzule and cyanogen exist in the almond, and, consequently, in the bark. The recent almonds, as also the bark, possess the odour of hydrocyanic acid, but when dry, are entirely void of it; hence we are led to the opinion that benzule and cyanogen do reside in the bark, but in what state of combination we are unable to say. Benzule has never been obtained in a free state, hence we know nothing of its properties as an isolated substance. But as it is possessed of considerable permanence, and may possibly be entirely void of odour, it may exist in combination with some substance, other than hydrogen, in the dry bark, which compound may not have any aroma.

Therefore, the most plausible theory is, that benzule and cyanogen do pre-exist in the bark of the Prunus Virginiana, which, by the decomposition of water, are converted into benzoic acid and hyduret of benzule, on the one hand, and hydrocyanic acid on the other.

TACCA OCEANICA.

Lahman & Duval Lith.

ART. LI.—ON A NEW SPECIES OF TACCA.

By Thomas Nuttall, Esq.

*Tacca *oceanica*, maxima, foliis palmato-quinque partitis coadunatis, laciniis palmato-multifidis acuminatis, ultimis trifidis; involucrum foliolis lato-ovatis sublobatis breviusculis.

Habitat. In rich shady woods, towards the mountains in Tahiti, and probably other of the Friendly Islands, as well as in Wahoo, Owyhee, and Atooi, of the Sandwich group.

Description. The root consists of numerous yellowish white skinned tubers, scattered over with eye buds like so many potatoes, and are, in fact, scarcely distinguishable from the roots of that common vegetable; from these arise in the summer season, clusters of tall spreading palmately divided smooth leaves, from two to three feet high, of which length the foot stalk forms two-thirds or more; the leaf itself extends out to the breadth of eighteen inches or two feet, and is divided into three primary divisions, and two others which are lateral, or come out above the base of the side divisions; these principal divisions are divided very much in the manner of our red oak leaves, or pinnatifid towards the base, and more or less dilated, and three-lobed beyond; each of the principal divisions again inclining to be three-lobed, except the central one, which is usually pinnatifid as well as terminally three-lobed; all the divisions end in acuminated points, and are, below, every where confluent into each other, down to the primary divisions or summit of the footstalk.

The leaves are, probably, possessed of some degree of succulence, but the vessels beneath present a strong, almost pinnated outline. The scape or flower stem, in the only specimen I possess, is very stout, and rather more than three feet high, attenuated towards the umbel,—whose involucrum consists of about two series of broad, ovate, acute, and sometimes slightly three-lobed leaves, which appear to have been white, or some brighter colour. The umbel consists of numerous longish pedunculated small brown, or brownish

red flowers, nearly campanulate, and consisting of a calyx only; within there are six hooded petaloid pedicellated bodies, answering both the purpose of petal and filament, each containing, and almost concealing (as in the infertile anthers of the larkspur) the two celled anthers. With the berry and germ I am unacquainted. As in the T. *pinnatifida*, there are interspersed among the flowers numerous abortive filiform peduncles, which form a crinite tuft extending far beyond the flowers.

The root of this plant, or the tubers, when pounded and washed, afford a fecula, which, under the name of *Pea*, is used extensively in the Sandwich Islands as an article of food, and goes among the white residents, usually, by the name of Arrow-root.

The present species is readily distinguished from that of India, by the broader, more divided, and coadunate leaves, as well as by the short and broad leaves of the involucrum; it is also, apparently, a larger plant in all its parts, save the flowers.

NOTES ON THE TACCACEÆ, BY THE EDITOR.

The genus Tacca was originally placed in the order Aroideæ, but it differs very widely from all its co-ordinates, and has some points of resemblance to the Aristolochiæ, as was noticed by Brown, *Prodrom.* between which two orders it seems to hold an intermediate position. It has, on this account, been regarded by later botanists as the type of a separate new order, called *Taccaceæ*.

The genus Tacca is thus characterized: Perianth superior, of one leaf, in six deep, eliptic, oblong, equal, converging, permanent segments. Carolla, none. Filaments six, opposite to the segments of the calyx, into whose base they are inserted, and half as long, equal, dilated, flat, oblong, incurved, and vaulted at the summit, anthers sessile in the hollow of each filament, of two distinct lobes. Germen inferior, roundish,

style short, cylindrical, with three furrows, stigmas three, spreading, dilated, cloven. Berry, ovate, angular, of one cell. Seeds, numerous, ovate, striated, inserted into three receptacles annexed to the coat of the berry. *Brown.* The regular pedunculated campanulate six cleft flowers, with six stamens concealed in petaloid appendages, and disposed in an involucrate umbel, with an inferior germ of six angles, &c., prove its near affinity to the *Liliaceæ,* approaching, even though vaguely, to the genus Brodiæa; while the foliage, habit, and roots, bring it back again to the Aroideæ. It belongs to *Hexandria Monogynia,* L.

The name Tacca, was employed by Rumphius, and adopted by Foster. The species described by the latter, is the

Tacca pinnatifida. It is stated to be a native of the East Indies, Cochinchina, the tropical part of New Holland, and the Society Islands, and was carried to England by Captain Blight, in 1792. The root is tuberous and perennial. Leaves one or two, radical, on long stalks, erect, deeply three cleft, with deeply and variously pinnatifid acute entire lobes, a foot long, smooth, reticulated with veins. Footstalk hollow, smooth. Flowerstalk radical, about three feet high, hollow, erect, unbranched, terminating in a simple umbel of several drooping, green, somewhat glaucous flowers,—accompanied by an involucrum of about as many upright partly pinnatifid green leaves, near two inches long, with a greater number of much longer thread-shaped bodies, suspected by Mr. Brown to be abortive peduncles. The berries are black, larger than a gooseberry, but little juicy when ripe.

Foster states that the fresh root is intensely bitter and acrid, though somewhat milder when cultivated. By being grated and repeatedly washed in fresh water, it yields a very white, mild powder, like starch, which is dried in the sun and then serves for food; either in the manner of salep, or baked into cakes, which are even better than those made of sago. It has been called Otaheite salep. This root is also applied as a plaster, for deep wounds made with darts or other weapons.

The article which is known as Sandwich Island arrow-root,

from the want of positive information, has been hitherto supposed to be derived from this plant; but during the recent visit made by Mr. NUTTALL to that island, he discovered that it is obtained from the species of which he has furnished us with an account,—a. the same time, it may be that both species are to be found among the islands of the Southern Pacific. The difference between the two plants may be understood by comparing the descriptions, and from the summary of the points in which they disagree, made by Mr. NUTTALL.

Sandwich Island arrow-root is a rare article in the American market. It has, however, been introduced; it is stated that a large quantity was some years since brought to the United States. Its properties are the same as those of the Burmuda, possessing equal whiteness and purity, if the same care be taken in its preparation. We are informed by Dr. RUSCHENBERGER, of the United States Navy, who has just returned from the Pacific, that he preferred it as nutriment for the sick on board the Peacock, to the ordinary arrow-root. It is sold in the Island at about six cents per pound.

SELECTED ARTICLES.

ART. LII.—OBSERVATIONS ON THE PRESENT STATE OF PHARMACY IN GERMANY. By Robert Kane, M.D.

Read before the King and Queen's College of Physicians, in Ireland, November 18th, 1836.

Most of those whom I have the honour to address, are aware of the remarkable difference which is found to exist in the relation of the apothecary to the physician, according as we contemplate the condition of the medical profession in the British Islands, or on the Continent. On the one hand, we see him forced by circumstances, against which the will or exertions of an individual are utterly unavailing, into seeking for medical practice; an attempt in which he can be successful only by voluntarily conceding to his aristocratic rival the possession of the higher departments of professional qualification. And, on the other hand, he is observed leaving the treatment of disease to those who are educated by the State expressly to that object, preparing those medicines which are deemed by the physician advisable, and employing himself in examining the qualities, composition, and method of extracting drugs, for the purpose of improving their form, and facilitating their therapeutical application.

I do not mean to occupy the attention of this meeting with any discussion on the comparative merits of one or the other of these arrangements; such an investigation would here be out of place, and, I believe, could not lead to any useful result. The voice of society has determined that, in these

kingdoms, apothecaries shall practise medicine; and all that remains for the consideration of those who possess power, is to provide that they shall know how to practise well.

Notwithstanding that I avoid entering upon that question, it may not be uninteresting to the members of the profession, and even to those non-professional visiters who are present, that I should describe to them, briefly, the actual condition of the apothecaries in Germany, in order that the position which the members of that department of the profession occupy, as well in general, as in strictly learned society, may be clearly understood; for, unfortunately, the statistics of medicine and of its professors, have not attracted the attention the subject merits; and I have known many of my friends, as well physicians as apothecaries, express their opinion, that the apothecaries of France and Germany must be in a miserable state; for my friends, having in their mind the condition of such as are in this country, were naturally led to conclude, that an apothecary who did not visit, but should live by making up prescriptions, could have but a very insufficient income. In attempting, by the following remarks, to dissipate these incorrect ideas, I shall confine them to the state of Pharmacy in Germany, as in that country the pure apothecary exists in a degree of purity unknown elsewhere; the laws in France, as we shall cursorily remark, reducing the profession to a very inefficient condition. And it is fortunate for the simplicity, as well as for the brevity of the communication, that the differences between the regulations of the various German States are so trivial, that the description can be found almost equally applicable to all.

The grand distinction between the apothecary in Ireland and Germany, is, that the latter is, in fact, an officer of the government. On his being pronounced by competent examiners properly qualified for the office, he is, on the occurrence of a vacancy, appointed to dispense medicines to the sick people; and the government, in place of paying him a direct salary from the public purse, enables him to pay himself by charging for his medicines; the price being fixed by authority,

and competition being prevented, in as much as none but apothecaries are allowed to retail drugs, and the number of apothecaries is kept within a certain limit.

Let us consider each of these circumstances a little more in detail; and first, what is, perhaps, the most important, the education of the pharmaceutic student. About the age of fourteen or fifteen, the boy undergoes an examination before the pharmaceutic commission as to his acquaintance with languages, (Greek, Latin, French,) the elementary mathematics, and general instruction, as history, geography. If he appears so advanced, that his special education can be commenced, he obtains a certificate to that purpose, and enters as lehrling or apprentice into a shop, for a term of three or four years. To almost every shop is attached a laboratory; and we must recollect that, with a German apothecary, the student spends the years of his apprenticeship, not merely in making up recipes, as is the custom here, but is engaged in the nicest investigations of modern chemistry, and works under the same circumstances that brought into action the neatness and accuracy of Klaplork and of Rose; that developed the transcendent powers of discovery possessed by Liebig and by Scheele.

The student having completed the term for which he had engaged to the apothecary, his master, passes to the university, and commences attendance on the lectures of such professors as he considers best qualified to teach him what he wants. There is no curriculum made out; he knows the subjects on which he shall be examined; but he is left to acquire the knowledge requisite for passing, when, where, or how he chooses; it being understood that he cannot leave his own country's university without special permission. For two or three years he attends the lectures on mathematics, physics, chemistry, botany, pharmacology, zoology, mineralogy, sometimes also anatomy and physiology; and generally works a year in the university laboratory, particularly if the university professor be of eminence.

When the student has thus spent at least five years in the

acquisition of professional knowledge, he acquaints the pharmaceutic commissioner, that he wishes to be examined, and is accordingly examined for two several days, and for more than two hours each day. The examination is rigidly confined to the physical and natural sciences, but is in these exceedingly strict.

In chemistry, in botany, in the natural history of drugs, and in the mode of preparing and compounding them, a degree of accurate knowledge is required which might prove very inconvenient to demand from many of our most admired teachers. If the candidate be approved of, he receives his license to hold a shop; his business then is, to try whether he can get one.

While the student has been thus reading for his degree in pharmacy, he generally attends the lectures of the professors to the philosophical faculty, and becomes, on the termination of his studies, Doctor in Philosophy. The majority of the leading apothecaries, whose acquaintance I was so fortunate as to make, are Doctors in Philosophy. In fact, the apothecary is as usually Doctor in Philosophy, as the physician Doctor in Medicine; the doctorate of the medicinal faculty being only a nominal degree, and quite distinct from the license to practise medicine. It is on this account, that persons who are rejected here, or in England, obtain doctorship in Germany so easily; but if they applied for a license to practise medicine, or to act as an apothecary, the result would give them an idea of an examination completely new.

Our subject, who is now Apothecary and Doctor in Philosophy, wishes to get a shop and commence business. A shop can be obtained, however, only by one or two means, opening a new one, or purchasing one already established; both of these methods are restricted in a very remarkable manner. The government, having compelled the student to a course of education requiring so considerable an outlay of time and money, is bound to provide that he can obtain a compensating return; and this is effected in a manner very well worthy of imitation.

To each district is allowed a number of apothecaries proportional to its population; averaging, in the greater part of Germany, one apothecary to 5000 persons. The shops are, of course, principally in the towns, and this might give rise to false impressions. Thus, in Giessen, with only 8000 inhabitants, there are three apothecaries; but the surrounding country is very densely inhabited. Round Darmstadt the population is not thick, and therefore, though with 22,000 inhabitants, it has but five. Gottingen, with 10,000, has only two, the neighborhood being but thinly covered with people. There are, however, real exceptions to this average. Thus, I was informed by Professor Dulk, that in Prussia Proper, and in Pomerania, owing to the scattered nature of the population, there is but one apothecary to 8 or 10,000. And in the Rhine province of Prussia, the other extreme prevails, for there are not more than 2000 people to one apothecary, owing to the law having allowed, during the occupation of the French, an unlimited number of shops, and many of them remaining still in existence.

In general, however, there are 5000 people to one apothecary; and no person is allowed to deprive him of them; no retail druggists are permitted; none but an apothecary can sell medicinal drugs. The apothecaries, themselves, are not allowed to compete, at least by reduction of prices. Every year a price list for drugs is published by authority; and no apothecary is allowed to deviate from the prices contained in it, which are placed so as to give a very high rate of profit; indeed much higher than could be obtained here.

When a district, from improvements of manufactures, or otherwise, increases in population, a corresponding number of new apothecaries' shops are opened by the government; or what is the same thing, permission is given to so many of those candidate apothecaries whose names are first on the list, to open shops in such places as require them. This is the one way of getting into business. The other is, that the shops in the already peopled districts, from time to time, fall into the market, either from the death of their previous possessors,

or from their possessors becoming legally incapable of continuing longer to trade in medicine.

In the case of a vacancy by death, the heirs of the late possessor have power to sell the concern, but the purchaser must be one of those who have obtained a license to open shop. And where the shop becomes void by the dismissal of the former occupant, he is always allowed by the government, though not entitled, to dispose of his interest in it to the best advantage, the purchaser being, as before, one of the qualified class.

The income arising from a shop being thus always respectable, and sometimes very considerable, the number of candidates, who are often taken from the most respectable burgher families, together with the comparative rarity of a situation becoming vacant, raises the price of a good concern far beyond what, to our idea, would appear its value. Thus, in towns of from 6 to 8000 inhabitants, it is usual to pay from 6 to £800 for an establishment. In larger towns, 12 or £1400 is not uncommon; but in large cities, as Berlin, Dresden, Vienna, &c., the prices become enormously high. Indeed, I was assured by a gentleman of great eminence, and on whose veracity I can implicitly rely, that a short time ago, a shop,—certainly one of the first in Berlin,—was sold, and 60,000 thalers, equal to £9000, paid down; I must add, however, that the establishments which bring such high prices are not mere apothecaries' shops; there is generally attached to them a factory of chemical preparations. The leading apothecaries are generally manufacturers of the nicer chemical substances, particularly the vegetable alkaloids; and the names of Merck, Winkler, Wittstock, and many others, are nearly as well known in the commercial, as in the scientific world.

I mentioned that no apothecary is allowed to charge more for his drugs than the price regulated by the list; and as this price is quite sufficiently remunerating, he is forbid in the strongest manner from attempting to increase his profits by substituting an inferior article. There is in each state officers appointed, comprising the University Professors of Chemistry

and Botany, who yearly submit to strict investigation the condition of every apothecary's shop in the district. We know that there is in this country a similar examination, but it is a mere matter of form; the results are never known, at least, publicly; and the punishment is of too ridiculous a nature ever to be inflicted. In Germany, however, it is quite a different matter: each shop is separately the subject of a report, comprising the details of the size of the shop, states of drawers, glass cases, the number of rooms, the number of pupils, the nature of the library which the apothecary possesses, of the laboratory, the age, quantity, and condition of every single medicine. I cannot trespass so much upon your patience as to attempt the description of the items of such a report, but I am fortunately enabled to present the scaffolding of one, which will give a good idea of it. The labour of making out such reports for a district, is of course immense; and my friend, Professor Wackenroder, of Jena, has had printed, in a tabular form, all important heads, which, thus arranged, require only to be filled up. A copy of his programme, which he kindly presented to me, I submit to the examination of the meeting, having first written under the German heads the corresponding English words, as there may be some gentlemen to whom the vernacular may be more accommodating than that foreign language. It will be seen, that there is scarcely a conceivable subject in connexion with an apothecary's laboratory and shop, which does not enter into the list, and is allowed full room for comment.

Submitted to so rigid an inspection, it need not create surprise that a shop should frequently give occasion to an unfavourable report of its condition. In that case, the owner, if it be his first offence, is severely reprimanded. If he be a second time detected, a pecuniary fine is inflicted to a considerable amount, but varying in proportion to the importance of the shop, and the more or less grave nature of the offence. On his being a third time denounced, he is suspended, his license to hold a shop is removed, and the concern becomes legally confiscated to the state; but, in fact, he always obtains

permission, either to make over the management, or altogether to sell his place to a person qualified to act, and of whom there are always many waiting such an opportunity; he is himself irrevocably dismissed from his vocation.

Having thus described the details of the regulations to which the apothecary in Germany is subjected, the result is capable of being conveyed in a very few words. He becomes the fellow labourer, but not the rival, of the physician. His education is equal, though in a different path. His origin is as high; his income is as considerable; and he is received in general and in learned society on the same footing as any other man possessing equal property and information. If we look to any meeting of the German Association of scientific men, we find an independent section for pharmacy; and we likewise see that the great mass of the work of the chemical and botanical sections is accomplished by persons, who, if not apothecaries, were originally intended to be such, had not their talents and love of science carried them to a higher sphere of action.

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ART. LIII.—EXTRACT FROM A LETTER FROM MR. WILLIAM GREGORY TO M. ROBIQUET, UPON EBLINA.

Dr. Apjohn and myself have analyzed a substance discovered by Mr. Scanlan, of Dublin, in impure pyroligneous spirit. This substance is yellow; crystallizes in prisms; is volatile in a current of air, and decomposes by heat, in a tube closed at the end; it is insoluble in water and in the alkalies; soluble in alcohol, ether, and concentrated acetic acid. Concentrated sulphuric acid acts upon it, developing a deep blue indigo colour, but which disappears rapidly by the deposition of an enormous quantity of carbon. The same acid, diluted

with an equal part of water, produces, by the aid of moderate heat, a reddish purple solution with the new substance. But this solution, after remaining at least two or three days, is deprived of its colour, depositing brownish black flocculi. Concentrated muriatic acid dissolves it slowly, producing a reddish purple colour, so beautiful and intense, that it can only be compared to that of a solution of an oxymanganate. This colour also disappears with time, depositing carbon in a very minute state of division. Nitric acid dissolves it, rendering the crystals black. No hyponitrous acid is disengaged, except when a fuming, concentrated acid is employed, and then oxalic acid is the product, accompanied with a yellow substance, precipitated with water, which, when dried and heated, is decomposed with slight explosion—at the same time disengaging red vapours. Dry chlorine changes the crystals to a brownish resin, when aided by moderate heat. We have, as yet, been unable to produce any crystallized combination with the new body, so that the analysis of it has not been consonant with atomic weights. The mean of four analyses has given us C. 75.275, H. 5.609, O. 19.116, from which is obtained the following empirical formula, C^{21}, H^{18}, O^{4}.

Mr. Scanlan has given this substance the name of *eblana*, (Dublin,) which he prefers to that of *pyroxanthine*, which I have proposed. This body, which is to be ranged among the products, already numerous, of dry distillation, resembles more the naphtalase of M. Laurent, than any other, from which, however, it is very distinct, in consequence of its solubility in alcohol and ether, its reaction with muriatic acid, and finally, its composition. You are, perhaps, already aware that Mr. Scanlan has extracted from the same pyroligneous spirit, by simple rectification, a considerable quantity of aldehyd, which is also one of the products of the distillation of wood. Mr. Scanlan thinks that the largest part of the aldehyd passes off with the gas; and it appears to me very probable, that by causing this gas to pass through cold water, the aldehyd could be collected, which might then be easily changed into con-

centrated pure acetic acid. This is worth the trouble of trying.

By mixing the sulphovinates with the yellow and red ferrocyanurets of potassium, I have obtained new salts, upon the analysis of which I am now engaged. With the sulphovinate of potassa, I have obtained two salts, perfectly analogous to the corresponding ferrocyanurets, but which, besides the iron, the potassium, and the cyanogen, contain also ethule C^4, H^{10}. These salts, when heated, give off alliacious vapour, which is, I believe, either the hydrocyanic ether of M. Pelouze, C^4, H^{12}, Cy^2, or the cyanuret of ethule, C^4, H_{10}, Cy. Analogous results present themselves with the sulphomethylate of potassa. You will infinitely oblige me by presenting these notes to the Academy, or Society of Pharmacy. As soon as I have terminated the analysis of the last mentioned salts, I will send you the details.

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REVIEW.

ART. LIV.—PHARMACOPŒIA OF THE ROYAL COLLEGE OF PHYSICIANS. London, 1836.

We may imagine the awe and admiration with which our fathers most probably regarded the first authorized codes of pharmaceutic lore; and as they studied the innumerable components of the Mythridate, what visions of powdered periwigs, long cues, three cocked hats, and gold headed canes, must have floated before their eyes. But now, when, "like angels' visits, few and far between," these comets spring forward to illuminate the medical horizon, we no longer are filled with alarm and dismay; every eye becomes armed with a philosophic tube, and particulars with respect to their disks, and tails, and perihelions, become subjects of the strictest scrutiny and criticism. There are many reasons why we should feel considerable interest in the publication of the New London Pharmacopœia. In this age of assimilation, no doubt the attempt will be made, before long, to make us Irish, swallow our medicine after the most approved London pattern; and it is most likely that this new edition of the London Pharmacopœia will be followed by a corresponding revisal of the Dublin. Now it becomes an important question, by how far the Dublin College can conscientiously agree with the results of London deliberation in promoting the assimilation referred to. We, therefore, open this book with more than ordinary anxiety, to ascertain whether it will serve as a model for a "Pharmacopœia Britannica;" but, previously to entering into an examination of its merits, let us inquire what are the objects which are desirable to fulfil in a Pharmacopœia; what are the principles upon which it should be founded. In our opinion, a Pharmacopœia should consist in an enumeration of the simples which should be kept in the laboratories of compounding chemists, together with a formulary for the preparation of all those compounds which are not usually found in com-

merce, and which are commonly prescribed by physicians. These we conceive to be the two great objects of a Pharmacopœia, which will be more or less perfect in the ratio of the completeness with which they are fulfilled. It is not as a means of advancing botanical or chemical science. It is not as an arena for the display of learning, in deciding difficult questions in natural history or medical literature. It is for the practical and useful purpose of requiring the employment of pure and constant medicines, in curing the diseases of his subjects, that his Majesty, William the IV., has sanctioned the present work. Now let us see whether the London College have justified the confidence of the king and council.

The preface tells us not to be in the least surprised at the Pharmacopœia of 1824 being now a little antiquated; that the College of Physicians had magnanimously determined to refurbish it, but found it a tough job—because "juste perpendere" was an act they were unaccustomed to. They were very desirous of obtaining the assistance of the Dublin and Edinburgh Colleges in framing a "Pharmacopœia Britannica;" but really, the distance was so considerable, that they were obliged to postpone this desirable consummation, until some further improvements are effected in the steam carriage. They are, according to their own account, very excellent chemists; and have added notes to the greater number of chemicals, by which the student or physician will be enabled to ascertain their purity. Having mentioned that there were some chemicals which they were willing to buy from manufacturers, they proceed to state—"licet ex his quædam nostro more præcipere maluimus, quam curæ ant incuriæ, aliorum permittere." Now, this we consider to be a very fair challenge; it is as much as to say—here we stand, with visors up, and lance in rest, ready for all comers; and we understand that one of their knight-errants has already broken a lance with a London reviewer; and yet, we—true Irishmen—are so heedless and headstrong as to be willing

"To try conclusions with these Janissaries,
And shew them what a pharmaceutic war is."

In fact, we do not hesitate to assert, that the chemical processes given in this Pharmacopœia are, in the first place, useless and uncalled for; in the second, neither calculated in many instances to obtain the cheapest or purest products. To prove our first position, it can easily be understood, that the persons engaged in chemical operations are either well-informed chemists, having recourse to the best authorities, and so independent of the Pharmacopœia; or ignorant persons without books, for whom the directions of the Pharmacopœia are quite insufficient. Let us take the preparation of nitrate of silver, as an example. You are desired to take

"An ounce and a half of silver; half an ounce of nitric acid; two ounces of distilled water. Mix the nitric acid with the water, and dissolve the silver in these in a sand bath; then increase the heat by degrees, and let the nitrate of silver be dried; liquify this in a crucible, by a gentle fire, till the water being expelled, the ebullition shall have ceased: then pour immediately into proper moulds."

Now all this, as far as it goes, is very correct; but no ignorant person could prepare a saleable article by such directions. Our friend, Mr. Ferguson, the late chemist at Apothecaries' Hall, could show the London College a great many omissions in their details. We have often seen the numerous precautions taken by this gentleman, and he has kindly permitted us to tell them. The pure silver of the jewellers is the kind he employs. It contains gold and some copper: by dissolving in dilute nitric acid, perfectly free from chlorine, the gold is thrown down as a blackish powder. It is better always to crystallize the nitrate of silver; and if it be necessary to filter the solution, let it be through pounded glass, for the slightest contact of organic matter will blacken the salt. The crystals should be placed in a glass funnel and washed with a stream of distilled water, which will carry all the nitrate of copper to the bottom of the funnel, so that if you reject a drachm or two of the salt in the neck, you will separate all the copper. The crystals must be then completely dried, and melted in a platinum crucible; if melted cautiously, there is no necessity for

the addition of nitric acid or fresh crystals, as recommended by some, such addition being liable to render the product of an Isabella yellow; then let it be poured into a warm silver mould. When nitrate of silver is prepared in this manner, it is perfectly white, and does not, as the Pharmacopœia misinforms us, become blackened in the sunshine. The test given for its purity in the Pharmacopœia is perfectly fallacious; for when chloride of silver is thrown down from a concentrated solution by an excess of chloride of sodium, some of the precipitate is always re-dissolved, and the supernatant liquid will consequently become discoloured by sulphuretted hydrogen. But nitrate of silver is not a solitary instance of the insufficiency of this book, for enabling an inexperienced person to prepare a chemical. No one, not previously conversant with chemical manipulation, could prepare sulphuric ether by the formula here presented. Even the directions for rectifying it are utterly insufficient, no clue being given to the proper temperature. The varieties of apparatus necessary for the different preparations, are passed over in the most dignified silence.

We now proceed to prove our second proposition—that the chemical processes are not calculated to yield either the cheapest or the purest products. In some instances, the process, not recommended, but commanded to be pursued, is not at all adapted for obtaining the intended product. Protoxide of mercury is desired to be prepared by agitating together a gallon of lime water with an ounce of calomel. We prepared some in the above manner, and when heat was applied to a portion, were edified with the spectacle of five-sixths subliming in the form of a protochloride of mercury; yet we are gravely told in the notes, that we may ascertain its purity by its not dissolving in muriatic acid—(how could it?)—by its completely subliming—(no doubt; but what are its products?)—and by its dissolving in acetic acid. We question whether the College applied this last test.

In other instances, preparations are directed which have not the slightest use in medical practice. Acetic acid is, for

the most part, used as a powerful corrosive; the Pharmacopœial acid is of such a strength as to be fit for little or nothing. Can any person, who ever practised pharmacy, read the directions without a smile? Take two pounds of acetate of soda, nine ounces of sulphuric acid, nine fluid ounces of water. The best way of making it, is by decomposing acetate of lead with strong sulphuric acid, (1.845,) and agitating the distilled liquid with peroxide of lead. Sometimes the process recommended is excessively wasteful. The trisnitrate of bismuth is directed to be prepared by pouring a solution of nitrate of bismuth into distilled water, and washing and drying the sediment. A great quantity of bismuth will be lost by this process, and the subnitrate obtained will be discoloured. Every manufacturer knows that the careful addition of water of ammonia to the supernatant liquid, as long as it remains acid, will obtain a much greater quantity, and that the water being acidulated with a little nitric acid, previous to the addition of the salt, will greatly improve its appearance. In Dublin we obtain it from the druggists in the form of beautiful capillary crystals.

We have instances where new preparations are substituted for old ones, with the most reckless indifference to the opinions of the profession. The old tartar of iron was a great favourite with many practitioners; it was made, as our readers are aware, by exposing iron wire, mixed with cream of tartar, to the united action of water and atmospheric air; the iron, influenced by induction from the potassium, only acquired a protostate of oxydation; and there was thus obtained a permanent protosalt, by many considered a desideratum in Materia Medica. But the College have substituted for this preparation a salt, formed by the direct combination of peroxide of iron and bitartrate of potash, which may, or may not, be a preferable compound; but they might, at least, have afforded to the profession the privilege of a choice. The whole preparation is worthy of notice, as a precious example of pharmaceutic legislation. To obtain the hydrated peroxide, you are to dissolve what is commonly called the precipitated

carbonate of iron (itself a hydrated peroxide) in muriatic acid, and throw it down again by liquor potassæ. Our readers may recollect the rhyme:

> "The king of France, with twenty thousand men,
> Sailed up the Scheldt—and then sailed down again."

Lastly, there are several preparations which are objectionable in every point of view. Tartar emetic is made by boiling cream of tartar with crocus of antimony. Hear what Berzelius says of this method: "L'ancienne pharmacopée suèdoise prescrit de faire bouillir, pendant une heure, du crocus avec de la crême de tartre, de filtrer la dissolution et de l'evaporer jusquá siccite, mais on obtient par ce moyen un produit dont la composition varie, et qui renferme quelquefois de la crême de tartre non saturée."

Iodide of potassium is made by decomposing the iodide of iron by carbonate of potash. This is Baup's process; which is objectionable from the difficulty of avoiding an excess of potash on the one hand, or of suffering a considerable loss on the other, from the precipitation of peroxide of iron carrying down a large quantity of iodine. Mr. Ferguson has mentioned to us a process which he has been in the habit of pursuing, which is simple, cheap, and most extraordinary: by boiling carbonate of potash, iodine, and iron turnings together, with a proper quantity of water, iodide of potassium is formed; carbonic acid and oxygen escaping with a violent effervescence, and the iron turnings remaining untouched. This is most strange, and evidently belongs to the operations of catalysis, lately generalized by Berzelius. We are told in the notes, (a fact with which chemists were hitherto unacquainted,) that iodide of potassium loses none of its weight by being subjected to the fire. Chloride of barium is directed in the Pharmacopœia to be prepared by decomposing carbonate of baryta with muriatic acid; every one knows how much more rare a mineral witherite is than heavy spar.

Sulphate of potash, the College order to be made by roasting the supersalt remaining after the preparation of nitric acid,

until the excess of acid is expelled. This is a most awkward method; besides, that this residual salt is much sought after in the arts. A much preferable method, is the direct addition of strong sulphuric acid to a concentrated solution of carbonate of potash. The acid will require to be added cautiously in a large vessel, on account of the violent effervescence; but the sulphate is thrown down in the form of minute, easily-powdered crystals, which, by those who are acquainted with the difficulty of pulverizing this salt, will be esteemed an advantage.

Iodide of mercury is directed to be prepared by rubbing together an ounce of mercury with five drachms of iodine; a little alcohol being added during the trituration. We prepared some in this way, and mixing it with a solution of chloride of sodium, allowed it to filter; upon the addition of nitrate of silver, a copious precipitate was thrown down, which only partially dissolved in water of ammonia. The iodide of mercury evidently contained a large quantity of biniodide.

It is quite unnecessary to multiply instances. We think we have sufficiently proved both our propositions; and that it will be generally allowed that the chemical processes of the Pharmacopœia are insufficient, and incapable of producing pure or cheap articles. Is it not a gross perversion of power, thus to dictate to manufacturers the method and the materials they are to use, in preparing things about which they must necessarily know most. The College have placed themselves in this predicament: either to oblige compounders to use no chemicals, except those that are made "nostro more," and so inflict a grievous hardship; or to connive at the use of compounds prepared very differently from their commands, and so dishonour the king's warrant. Leaving the College to wriggle, as well as they can, from between the horns of this dilemma, we proceed to examine the remainder of their preface.

The next subject of importance referred to, is the change of names, which, they assert, is one of considerable difficulty; but it appears that they have made up their minds, for they

say, "quoniam nobis persuasum est rei cujusque nomen id demum certissimum et stabillisimum fore, quod artis suæ principes imposuerint." Now, like Dr. Franklin, when we get a good principle we like to go through with it; "the name is the most certain and permanent which is imposed by the principles of the art itself." Very well. So we have "cupri ammonio-sulphas:" "ferri ammonio-chloridum:" "ferri potassio-tartras:" "ferri sesquioxydum:" "hydrargyri ammonio-chloridum." But why call yellow prussiate of potash "potassii ferro cyanidum?" It should be, according to their own rule, ferri potassio cyanidum. And again, do the principles of the science impose names inconsistent with chemical composition? Is there any reason to believe the "ferri ammonio-chloridum" to be a chemical compound? One atom of acid to fifty of base, would be a new fact in chemical combination. An oxide of iron containing twelve or fifteen per cent. of protocarbonate, has not been hitherto considered a very pure sample of sesquioxide. Sal alembroth cannot certainly be the compound intended by the "hydrargyri ammonio-chloridum," and yet we know of no other deserving of the name. Mr. Hennell considered white precipitate to be a compound of peroxide of mercury and sal ammoniac. And our friend, Dr. Kane, supposes it to be a combination of bichloride of mercury with amiduret of mercury; but neither view will license the pharmacopœial title. Again, prussian blue is not a percyanide of iron, but a mixture of both cyanides. But, really, it is too absurd, in the present state of chemical nomenclature, to put the profession to the trouble of altering the names of almost every medicine. Scarcely two writers on chemistry are agreed with respect to nomenclature; what one calls "sesquioxide of iron," another calls "ferric oxide;" what one names "hydrargyri ammonio-chloridum," another styles "chloro hydrargyrate of ammonium;" and others, "the double chloride of mercury and ammonium." Very little doubt remains on the minds of many chemists, that the compounds, hitherto called "hydracids," are actually bases, like the haloid salts of iron or zinc.

The very term, "salt," as it is now used, is most objectionable; conveying an idea, in chemistry, utterly at variance with its ordinary acceptation. The present system of chemical nomenclature is most unlikely to be permanent, different principles being acted on in naming perfectly analogous groups of amphide salts. Is the science of medicine to be perpetually agitated by every wind of nomenclature, confusion and danger to human life being the necessary consequence of every sudden change?

Leaving the preface, we now turn to the body of the work itself. And here we are startled by the alteration of the liquid measure, from the wine to the imperial gallon, and shocked by the excessively careless manner in which the alteration is effected; no comparison, whatever, is instituted between the new and the old measures; no notice is taken of the fact, that the new ounce is about eighteen grains lighter than the old; or that the new pint is 1460,5 grains heavier than the old. The number of grains of distilled water contained in the imperial gallon, is not even hinted at; and there is not the slightest allusion to the change of measures throughout the body of the work. Now, when it is recollected the class of persons for whose use the Pharmacopœia is principally intended, and the dreadful consequences liable to ensue from mistake, this negligence must be considered as most culpable. How can the members of the College expect apothecaries' apprentices and druggists' assistants to be less liable to error than themselves. When we find a council of sage medical gentlemen, "with spectacles on nose, and brows of monstrous size," writing "decem," instead of *duas*, (*vide* Errata;) "uncias duas," instead of *drachmas duas* (*vide* Tinctura Ammoniæ Composita;) "tribus," instead of *duabus*, (*vide* Ammoniæ Liquor, F.;) and prescribing the materials for preparing prussic acid of the strength of two grains in the "ounce," instead of "100 grains," surely we need not be astonished, if a stupid boy should make arsenical solution with eighty grains to the wine pint, in place of the imperial.

In turning over the pages of the Materia Medica, we con-

fess ourselves completely dazzled by the display of scientific learning exhibited. Galls are "gemmæ morbidæ;" it is the cormus of the colchicum; the "rhizoma" of the ginger; the "fructus" of the umbelliferous plants, which are ordered to be employed. Unfortunately, botanists are not agreed about the term "cormus." Wildenow and Decandolle define it to be "partie des vegetaux cryptogames qui se trouve hors de terre; la fructification exceptée." We are not inclined to quarrel about trifles, but surely it is right to be consistent; if we speak of "carraway fruits," and not carraway seeds, we should not talk about the "simple flowers" of the chamomile; the bark of the fruits of the orange; the pulp of the legumes of the "cassia;" or more correctly, the "catharto-carpus fistula," whose fruit is not a legume, but a lomentum. The "dried pulp of colocynth:"—"pulp" is applied to cellular tissue contained within the cells of the carpels; the part of the colocynth used, is the sarcocarp, or flesh. The "stigmas of saffron:"—stigma is the denuded extremity of the style; it is the styles that are employed. Here, again, we have some desirable information afforded us. We were not before aware that musk was "humor in folliculi præputii secretus;" and we we were much edified by the Hispanio-Latin coinage, "Vinum Xericum." But we are sick of this petit maitre kind of science. "In our souls we loathe all affectation;" and when men are called on to perform a grave and important duty, the exhibition of pseudo-scientific frippery is most uncalled for. Forsooth, red bark is the produce of the "cinchona oblongi folia;" aloes, of the "aloe spicata;" rhubarb, of the "rheum palmatum;" copaibi, of the "copaifera langsdorfii."

"Si j'ouvre l'historie de la matière mèdicale," writes a very great authority, "j'observe qu'un grand nombre de medicamens, meme les plus actifs, qui, dans l'enfance de la science avaient été regardes comme les produits d'une seule plante, se sont trouvés, lorsque leur histoire a été mieux suivie, appartenir a plusieurs espèces, voisines-ainsi le quinquina est tirè de toutes les espèces de vrais Cinchona, la rhubarbe de presque tous les Rheum, l'opium de plusieurs Pavots, le semen-

contra de plusieurs Absynthes, la terebinthine de la plupart des Pins, ainsi l'histoire mieux connue de la gomme adragant nous montre qu'on la tire de plusieurs astragales èpineux: il en est de meme de la gomme arabique qui de-coule de plusieurs Acacias." In fact, what had the framers of the Pharmacopœia to do with these disputed points? That which they should have done, they have left undone; *i. e.*, to furnish a complete list of drugs, with a description of the varieties which are proper to be kept in apothecaries' shops; thus, they mention aloes, sarsaparilla, opium, &c., without affording any clue to the kind which ought to be preferred, although it is notorious, that the varieties met with in commerce differ in a most remarkable degree. We have at present two specimens of sarsaparilla root before us, the one with a light brownish cuticle, rather thick, with a considerable layer of amylaceous substance between the epidermis and the woody centre. The other, with a cuticle of a much darker brown, a very thin, reddish layer placed between it and the central wood. The first produces an infusion similar to turbid beer; the latter, when infused, gives the water the clear, deep red of the best brown stout. Now which of them are we to employ? The College gives us no directions. The best Turkey opium usually yields twenty pounds of extract from twenty-eight pounds used. We have known dry Egyptian opium to give more than its own weight; but it is quite a matter of indifference to the College of Physicians.

We find scammony, sometimes, as light and porous as a pummice stone; at others, dense, heavy, and dark coloured. The one is as good as the other, in the estimation of the Pharmacopœia. Here are two varieties of senna leaf; the one requires much more to be employed, in making an equally dark coloured decoction, than the other; whilst its smell is most nauseous and unpleasant, that of the other being aromatic and agreeable. We are left quite in the dark which of them to prefer. Now, when it is recollected that this is the very purpose for which a Pharmacopœia is intended, this negligence is most reprehensible. We hope to see, in future Pharma-

copœias, a complete description of the drugs ordered; such as will enable the best to be easily recognised, together with the means, as far as is known, of testing their purity, and of removing adulterations. These are the legitimate objects of a Pharmacopœia.

With respect to the pharmaceutical preparations, this book is miserably deficient. One of the few sensible alterations which we have observed, is, directing the aromatic waters to be prepared by rubbing the oil together with carbonate of magnesia and the proper quantity of water, and then filtering. But even here we have the usual exhibition of negligence. Do they mean, that as much oil of roses should be employed, as oil of cinnamon? Hemlock poultice is desired to be prepared by mixing together two ounces of extract of hemlock, a pint of water, and a sufficient quantity of linseed meal. What an expensive and awkward process! Yeast poultice is to be made with a pound of flower and half a pint of barm. We refer them to Mr. Donavan's paper, in the Annals of Pharmacy, for the year 1830, to show them the absurdity of this preparation. "Ceratum sabinæ" is useless, according to their method of preparing it. How much of the essential oil do they imagine will be extracted by immersing savine leaves in melted lard, and then expressing? The Dublin College go to the other extreme, in a similar preparation; directing you to fry the leaves in lard, and, consequently, driving off all the essential oil. The best way of preparing it is, to rub a determinate quantity of essential oil with simple ointment. "Ceratum saponis" still continues with all its imperfections on its head. By boiling soap together with a solution of acetate of lead, some very excellent lytharge plaster is formed, which floats in a solution of acetate of soda; by boiling down the liquid to the consistence of a paste previous to the addition of the soap, this might be avoided. We refer them to Mr. Ferguson's paper, in the first volume of the Dublin Journal. There is an air of mock dignity about the directions of all pharmacopœias, which affords us much amusement, but which is connected with this inconvenience, that great difficulty is

felt in getting down from the stilts, to afford the necessary minute directions: thus, you are desired to powder saffron, tragacanth, myrrh, hippo, scammony, colocynth, &c., although left without any direction in what manner to proceed; and when advice is vouchsafed with respect to the method of compounding, it is, in many instances, impracticable to be obeyed: thus, in the confection of rue, you are desired to powder gum sagapenum, a process of some difficulty, it must be confessed. Why have they so wantonly altered the proportions of tobacco enema, from one drachm in sixteen ounces, to a drachm in twenty; and in the infusion of digitalis, from a drachm in eight ounces, to a drachm in twenty ounces. No directions are given about the temperature at which turpentine enema should be made, so the compounder is perfectly at liberty to coagulate all the albumen of the egg, if he wishes. The old process for inspissated juices is preserved, without any regard to the late discoveries or improvements. Compound infusion of senna still retains its place, although it must be well known to the members of the College, that it is always prepared by decoction. How ridiculous, also, to direct the compound infusion of roses to be infused during six hours. These are preparations usually wanted for immediate use, and are not injured by a short decoction; on the contrary, much more of the active principle of senna is extracted by boiling, than by macerating. We have been amused by the manner, throughout the whole work, in which the specific name of the plant is substituted for the name of the drug; thus, in "confectio piperis nigri:"

℞. Piperis Nigri,
Inulæ, singulorum Libram,
Fœniculi Libras tres,
Mellis,
Sacchari, singulorum Libras duas.

Can this be considered as a substitute for the old system of transubstantiation in the defunct Pharmacopœia, where a

whole section was headed "Vina," although not containing a drop of wine in any of the preparations it contained. In the teeth of the temperance societies, the College have, however, restored real wine to the present edition. And to show, moreover, the determined "spirit" in which they are resolved to resist new-fangled innovations, they have introduced a formula for the preparation of "Mistura Spiritus Vini Gallici;" Anglice, egg-flip. We assure you, reader, it is no joke; here it is, page 143. "Take brandy and cinnamon water, of each four fluid ounces; the yolks of two eggs; half an ounce of purified sugar; two minims of oil of cinnamon.—Mix." We have it in contemplation to make some experiments on this preparation, during our leisure hours.

The directions for making simple syrup are, ten pounds of sugar to three pints of water; this is by far too much. Liniment of verdigris is still retained in its old form, although it is notorious, that when made some time it does not contain one particle of copper; it should always be pre-prepared extemporaneously, by rubbing up the distilled verdigris of commerce with honey. The change of names is sometimes most absurd in this department: think of calling mucilage of gum, "mistura accaciæ;" this same mistura acaciæ is used for making several pill masses:—the very worst thing they could have chosen. But we leave the catalogue of errors, first recording our hope that the "Pharmacopœia Collegii Regalis Medicorum Londinensis" may never become the "Pharmacopœia Britannica."

JOHN ALDRIDGE.

Dublin Journal of Medical Science.

ART. LV.—FACTS TO SERVE AS A CHEMICAL HISTORY OF GENTIAN ROOT. By M. Claude Leconte, Paris.

Gentian, *(Gentiana lutea, L.)* called also yellow gentian, and great gentian, belongs to the dicotyledonous, monopetalous, hypogynous plants of Jussieu, to the vascular, exogynous corolliflowered, plants of Decandolle, and to the class Pentandria, order Digynia, of Linnæus. According to Dioscorides and Pliny, the name of this plant is derived from that of Gentis, or Gentius, King of Illyria, who appears to have recommended its root for certain epidemic diseases.

This root being one of the most noted remedies of our indigenous materia medica, at an early period attracted the attention of chemists; yet, it must be said, the data which science has bestowed, as to the nature of its constituent principles, are far from being complete.

In the year 1819, when MM. Pelletier & Caventou made their fortunate investigation of the barks, and discovered quinia, which has since been of so much consequence in therapeutics, M. Henry endeavoured to isolate the active bitter principle of gentian. This skilful operator, having exhausted the power of solvents upon this root, successively separated from it, by ether, an oily substance, possessing odour and bitterness, united with another glutinous substance less bitter, which he compares to glue; by alcohol, a very bitter extractive substance, soluble in water, which he has considered as containing the sole active principle; by water, an insipid mucoso-gummy matter.* About the same time, MM. Guillemin & Foecquemin addressed to the Journal de Pharmacie, a paper upon the same subject. It results from their

*M. Fee, in his Cours d'Histoire Naturelle Pharmaceutique, in addition to the principles stated by M. Henry, enumerates silica, alumina, magnesia, and iron, in accordance with the researches of MM. Guillemin & Foecquemin. M. Henry has not given, as asserted by M. Fee, the name of gentianin to his bitter extract, this product not being the same as the gentianin of MM. Henry & Caventou.

researches, that gentian contains a soft, fatty matter, having some resemblance to wax, sugar, gum, and a resinous substance of insupportable bitterness, which they regard as the active principle, mixed with substances from which they could not separate it.

Among the inorganic products, they have pointed out the presence of lime, alumina, silica, magnesia, and iron, united with carbonic, muriatic, and sulphuric acids. The following year, MM. Henry & Caventou resumed their labours upon gentian, and published a memoir, in which they announced, that they had isolated the active principle, to which they gave the name of gentianin. They there state, moreover, the presence of the following substances: glue, a fixed oil, an undetermined acid, an odoriferous principle not isolated, uncrystallizable sugar, gum, a yellow colouring matter, and lignin. It should be added that, in 1814, M. Planche had made known a volatile principle, capable of producing nausea, and a species of intoxication.

Finally, very recently, M. Denis has demonstrated in gentian the presence of pectic acid, which undoubtedly is the mucoso-gummy matter, in the first instance spoken of by M. Henry.

The memoir of MM. Henry & Caventou, and the therapeutic experiments made with gentianin appear so precise, that the conclusions of these chemists had to be admitted, and all that has since been written, in works upon Chemistry, Materia Medica, and Pharmacy, has been drawn from this memoir. I certainly should not have conceived the idea of making researches upon a subject, which has passed through the hands of masters so distinguished, if having been élève interne of the Pharmacie contrale, I had not been charged by M. Soubeiran with the preparation of gentianin, according to the received method. In the first instance, I encountered some difficulties, and at length succeeded in obtaining this product, but with less ease than had been stated by the authors of the discovery; and I was very much astonished, when, upon wishing to purify and deprive it of its yellow colouring matter, had this been prac-

ticable, that I obtained it, after several crystallizations, completely deprived of its bitter taste. It is this circumstance which induced me to undertake some experiments upon gentian, in order to discover the nature of the bitter principle; the substance which had been regarded as such, not being the yellow crystallizable matter, which does not possess any bitterness.

In the course of my experiments, I have been enabled to observe, that when submitting gentian to the action of solvents, it is important to take into account the differences of purity, of concentration, and of temperature. I shall endeavour to show this, by noticing the principle ones—ether, alcohol, and water.

Ether, deprived of alcohol, and perfectly dry, brought in contact with gentian, pulverized, and deprived also of its hygrometric water, affords a liquid, little coloured, which, by evaporation, leaves a product possessed of very little bitterness. If, on the contrary, ordinary ether is employed, which is always mixed with a little water and alcohol, and gentian charged with the humidity of the atmosphere, the liquid is more coloured, and affords as a residue a very bitter substance. By operating with dry ether and dry gentian, I have always obtained, as the product of evaporation, a soft substance excessively sticky, without the appearance of crystals, and composed of glue, oil, and gentianin. By employing humid materials, I have constantly had mixed with the first product, a brown substance, excessively bitter, acid, soluble in alcohol, and partially in water, appearing to be formed of a sort of extracto-resinous matter, an acid strongly reddening litmus, and a very bitter deliquescent substance.

By treating gentian with boiling alcohol at 40°, a liquid little coloured is obtained, which, upon evaporation, affords an excessively bitter extract, composed of a fixed oil, a yellow crystallizable substance, resin, sugar, free acid, and bitter extract. If the alcohol is employed cold, the extract is less coloured, and affords small yellow crystals, formed in the glutinous mass. It also contains less resin.

Alcohol at 35°, whether hot or cold, furnishes an extract

which has a very great resemblance to that obtained by alcohol at 40°.

Alcohol at 30° dissolves very nearly the same principles, but the extract is then much charged with resin, which is with difficulty separated from the yellow crystals, and which renders their extraction very difficult.

All these alcoholic extracts, taken up by water, give nearly the same products. Water removes the bitter extract, the sugar and acid, and leaves the fixed oil under the form of white flocculi, and the yellow crystals united with a little resin. It is easy to isolate these last products, by treating them with boiling alcohol at 30°, which dissolves the gentianin, the resin, and a very small quantity of oil, which can finally be removed by a little cold ether. Cold alcohol at 40°, however, affords crystals less charged with resin, and more easily purified.

Water, by the first maceration, removes from gentian all its colour, and a great part of its bitterness. It dissolves, in a great measure, the pectin which gelatinises at the end of a certain time. Having acted, by means of ether and alcohol, upon gentian exhausted by water, I was not able to obtain gentianin from it, which led me to think that it is removed by the water, in despite of its little solubility in this vehicle, and doubtless favoured by the other principles contained in the root, which facilitated solution.

Water, holding an alkali in solution, removed still more promptly the colour and bitterness of gentian. When acidulated, nothing of consequence resulted.

Gentian, exhausted by alcohol, is completely deprived of its bitter portion. There is nothing, except ether, when it is very pure, which is not charged with it; or, to speak more rigidly, does not take up traces of it.

Of Gentianin.

The name gentianin, given by MM. Henry & Caventou to the yellow crystallizable substance, conveys the idea that this substance is the cause of bitterness in gentian, and the principle of its action upon the animal economy.

I have already shown that this gentianin can be deprived, by successive crystallizations, of all the bitter principle which it contains in the state of mixture; but as the word gentianin has been for a long time employed to indicate the bitter principle of gentian, I have judged it proper not to employ it to designate a substance entirely destitute of bitterness; although it be true to state, that it composes in a measure the gentianin of MM. Henry & Caventou. I propose, in consequence, the name of gentisin, which sufficiently recalls its origin, and which I derive from Gentis, King of Illyria, to whose memory the genus Gentiana has been consecrated.

To procure their gentianin, MM. Henry & Caventou have employed ether, strong alcohol, weak alcohol, then water and magnesia, and finally ether; they have even retaken the magnesian precipitate by oxalic acid. It is true, that ether, although imperfectly dissolving gentisin, removes from gentian all its yellow crystalline matter; but it is necessary to employ a considerable amount of ether to obtain a small quantity of product, and the substance is connected with glue, which requires several alcoholic solutions to be separated.

This method is, therefore, long, difficult, and expensive. From among the solvents of gentisin, I have endeavoured to find one which would yield me a pure product by a method more prompt and more economical. Alcohol at 40°, at 35°, at 30°, and water with an alkali in solution, were successively employed, as well hot as cold; it is cold alcohol at 40°, which has afforded me most advantages.

To prepare gentisin, I take coarsely powdered and dried gentian. I treat it by successive macerations in alcohol at 40°, until it no longer becomes coloured. The liquids, being united and filtered, are submitted to distillation; the extract obtained is treated by water, which dissolves the bitter extractive matter, the free acid, the sugar, and leaves under the form of white flocculi, the fatty matter in union with the gentisin. This precipitate is collected, washed, dried, and redissolved in boiling alcohol at 30°, which dissolves the yellow

crystalline substance, and hardly acts upon the fatty substance. If the gentisin, when crystallized by cooling and spontaneous evaporation, still contains a little oil, which may have been retained from the ebullition, it can be removed by a little ether. If it be re-dissolved in boiling alcohol at 30°, it is obtained under the form of perfectly pure and beautiful yellow crystals.

Whatever method I might employ, I have never obtained more than one part in a thousand, as the product.

Gentisin is of a pale yellow colour, crystallizes well in long needles, is extremely light, has a feeble, peculiar odour, and no taste; it possesses no action upon the economy; several grammes may be taken with impunity. When exposed to the air, gentisin undergoes no alteration; heated to 100 R. in a salt water bath, it does not lose weight, and undergoes no change.* Placed in a tube plunged in oil heated to 250°,† it is not decomposed. At a temperature approximating 300°, it assumes a light brownish tint, but still is not volatilized. But by heating it by means of a spirit lamp, this substance gives off some yellow fumes, which are condensed in the cold portion of the vessel. By continuing to heat it, it becomes more and more deeply coloured; is diminished in bulk and enters into fusion, assuming the appearance of a fatty substance. If the heat be not pushed too far, the gentisin, in part decomposed, and having the appearance mentioned, becomes concrete upon cooling. It then takes the appearance of a brown mass, with a crystalline structure; if a small porcelain

* It is stated, in the number for July of the Repertoire de Chemie et de Physique, p. 110, in a note by M. Trommsdorff upon gentianin, that "heated in a glass tube to the temperature of boiling water, a small quantity is decomposed, and the remainder sublimes under the form of yellow needles." This is, doubtless, by mistake, as MM. Henry & Caventou did not announce it in their memoir, and as gentianin is far from being decomposed at this temperature.

† M. Fee, in his Cours d'Histoire Naturelle Pharmaceutique, also tells us that gentianin is decomposed at 135°, and yields as a product an azoted matter. This, moreover, is not mentioned in the memoir of MM. Henry & Caventou.

capsule be employed, and this be inclined to expose the structure, it will be found to have crystallized in small needles.

Gentisin is very little soluble in water at the ordinary temperature, the proportion is 0.020 to 100; boiling water dissolves but 0.026. If a small quantity of sulphuric, nitric, or muriatic acids be added to the water, the solvent power is not augmented; if, on the contrary, a small quantity of alkali be added, (potassa, soda, or ammonia,) the liquid immediately assumes a beautiful yellow colour, and the crystals are completely dissolved, and in large quantity.

110 of alcohol at 30°, dissolves 0.20 of gentisin at the ordinary temperature; upon carrying it to ebullition, it dissolves 1.12, and allows it to deposit in beautiful yellow crystals upon cooling. Alcohol at 40°, dissolves 1.60 when in a state of ebullition, and only 0.22 at the ordinary temperature.

Ether, which hitherto has been regarded as its best solvent, does not take up at the ordinary temperature, but 0.050 to the 100, when it is pure.

The alkalies dissolve it without alteration, and form with it crystallizable compounds, which I have been inclined to consider as true salts. But they are decomposed easily; and not having been enabled to study more than a single one, I have hesitated to give to gentisin the name of gentisic acid, which perhaps would be more appropriate. Like many colouring substances, it appears truly to play the part of an acid as regards bases.

I shall, nevertheless, present some of the characters of very beautiful yellow crystals, which I obtained by combining gentisin with soda. By adding some drops of caustic soda to distilled water holding in suspension crystals of gentisin, they were promptly dissolved, and gave to the water a beautiful yellow colour. By evaporating the liquid almost entirely, a crystalline mass was obtained, which, treated with boiling alcohol at 30°, was partially re-dissolved; and, upon cooling, was deposited under the form of beautiful long crystals of a golden colour. These crystals, collected and dried by expo-

sure to the atmosphere, presented the following characters. Heated to 100°, they lost 23 to 100 of their weight, and assumed a reddish tint; by continuing to heat them in a glass tube to 250°, they became brown, without undergoing decomposition. At a more elevated temperature, exposed to the air, the substance was blackened, inflamed, and left as a residue a white ash retaining the form of the crystals. If heated to redness, the residuum entered into fusion, and left, upon cooling, a hard mass, which, with re-agents, exhibited the characters of carbonate of soda.

110 parts of boiling alcohol at 30°, dissolved 10.3 of gentisate of soda, and when cold, 7.0. This vehicle allows crystals of gentisin to be deposited, and retains the soda. The solution of gentisate of soda is of a beautiful yellow colour. If a current of carbonic acid gas is made to pass through it, the liquid is deprived of its colour, and deposits gentisin of a white colour, which, however, resumes the yellow tint when desiccated.

Upon burning gentisate of soda in a platina crucible, and adding sulphuric acid, I obtained sulphate of soda, the weight of which indicated the quantity of soda. It results from this experiment, which has always given the same weight when repeated, that the gentisate of soda is formed of 6.81 soda, and 93.19 gentisin.

The action of concentrated acids upon gentisin affords nothing remarkable. With sulphuric acid the colour is deepened, is suspended, and disappears in part; heated, it becomes red, then black, and if it is evaporated, nothing but carbon remains. There is no action when the acid is diluted. Concentrated nitric acid exhibits no action at the ordinary temperature; if heated, the substance becomes coloured greenish yellow; and if carried to evaporation, it becomes black, and leaves carbon as a residuum.

I should state here, that recently, and about the time that I announced that the crystalline substance of the gentian is not the bitter principle, results analogous to those obtained by me were published by M. Trommsdorff. He, however, asserts

that gentianin sublimes without residue at a moderate heat. I have always witnessed the contrary—that it could not be made to sublime without decomposing a large portion. He also announces that this substance decomposes alkaline carbonates. I, on the contrary, have seen carbonic acid decompose the gentisates and separate the acid in a pulverulent form. If an excess of gentisin is boiled in a solution of very pure carbonate of potassa, and the gaseous product passed through lime water, carbonate of lime is not formed, and the gentisin preserves its pale colour, which is a proof that it has not entered into combination with the potassa.

Glue of Gentian.

This differs from ordinary glue, in its colour, fusibility, odour, and composition. The glue of gentian has a soft consistence, is very tenacious, has a yellow, sometimes a greenish, colour; its smell is feeble, and is analogous to that of gentian; it has no taste; when heated, it softens at 40°, and melts at 50°. It is insoluble in water, and in alcohol at 30°. It dissolves well in the oils, essence of turpentine, and ether. If treated with boiling alcohol, at 40°, it is partly dissolved, letting fall, upon cooling, a white, fatty, sticky substance, which appears to be formed of a waxlike substance and a green oil. The solution retains only the green oil. By treating several times, with alcohol at 40°, the glue which had not been dissolved by the first treatment, the alcohol becomes charged with new quantities of oil and wax. If the residuum be acted upon by absolute alcohol, a large proportion of this product is still removed, which is precipitated by cooling. This deposit is white, pulverulent, no longer adheres to the fingers, and appears to be almost pure wax. Finally, the substance which cannot be dissolved in alcohol, is dissolved in pure ether, which, when evaporated, leaves a brown, elastic product, non-adherent to the fingers, lighter than water, entering into fusion at 120°, burning in the flame of a candle, and diffusing the smell of caoutchouc. The cereous substance appears to possess considerable resemblance to ordinary wax. Heated, it

melts at 62°; and upon cooling, assumes such a consistence that it does not adhere to the fingers, and can be polished by the friction of the finger nail. Treated with alcohol, it appears to separate into two parts; one soluble, resembling cerine; the other insoluble, which appears to be myricine.

The fixed oil is in every respect analogous to other fatty substances. It is fluid, and thickens rapidly, in the same way as drying oils; its colour is greenish; its smell is that of gentian; it has no taste. It is insoluble in water, and in alcohol at 30°, but is readily dissolved by ether, and alcohol at 40°. These characteristics induce me to conclude, that the glue of gentian is a mixture of fixed oil, wax, and caoutchouc.

The glue is readily obtained by treating dry gentian with pure ether, and removing the yellow crystals and oil with alcohol at 40°.

Bitter Principle of Gentian.

The time was not at my disposal to follow out completely the research, as regards the bitter principle of gentian. As it results from the experiments which have been reported upon the action of solvents, that the alcoholic extract is that which presents the bitter matter less connected with other extractive principles, gum and sugar, it was from this extract that I endeavoured to obtain it.

By treating the alcoholic extract of gentian with cold water, there are obtained, on the one hand, flocculi, composed of gentisin, resin, and a fixed oil, which can be deprived completely, by washing, of the bitter principle with which they are united in a state of mixture. There is obtained, on the other hand, a liquid of extreme bitterness, which determinately reddens litmus. By precipitating it with the subacetate of lead, two different products are obtained. The plumbic precipitate holds in combination the substance to which the solution of the principles of gentian owes its acidity. It can be separated by sulphuretted hydrogen. I have not, as yet, sufficiently studied its properties. The liquid which has furnished the deposition of lead, retains the bitter principle. By precipi-

tating the excess of lead by sulphuretted hydrogen, and concentrating the liquid by means of a salt water bath, an extract, both bitter and sweetish, is obtained; it is very soluble in water, and allows but few flocculi to deposit. Ether separates a colourless fatty matter, possessing a strong aromatic odour, and formed of oil of a very bitter odorous substance, and of wax. I have not pushed my researches further.

The presence of the acid in the plumbic precipitate, and that of the bitter substance in the liquid already deprived of a great number of the principles of gentian, form a landmark, which hereafter will serve as the point of departure for the experiments which I propose to make, in order to isolate the bitter principle; so far, it has been determined that this principle is very different from the crystalline substance, which has been conjectured long since.

Considerations upon the Pharmaceutic Preparations of Gentian.

The preparations of gentian are few in number, if we refer solely to those in which gentian is the principal base of the medicine. At once, it is evident, that it is proper to erase completely from our formularies the preparations of gentianin proposed by M. Magendie, which were originated at the period when gentianin was considered to be the bitter principle of gentian, but which lose all their interest and value, as soon as it is proved, that this pretended principle can contain but a minute and variable quantity of the true bitter principle of the root. Besides, the little efficacy of gentianin is proved by the experience of M. Magendie himself, who has taken, he says, two grains of gentianin dissolved in alcohol, without experiencing any sensation, except that of a little heat in the stomach.

Distilled water of Gentian. This is little employed, and perhaps merits being consigned to oblivion, since, from the observations of M. Planche, it has a vinous and nauseous smell, and can, when cohobated several times, produce sickness, and even a certain degree of intoxication. I have pre-

pared this distilled water, by pounding the root in a mortar, moistening it with half its weight of water, and after twenty-four hours distilling it in an apparatus furnished by M. Soubeiran, I have derived from one part of the root four parts of limpid distilled water, having a marked odour and a pungent taste.

Watery solution. Cold water removes from gentian the bitter principle, sugar, gum, a portion of pectic acid, the acid principle gentisin, a little oily substance and resin, as well as a portion of odorous and volatile matter. Hot water, employed in infusion, has an action exactly similar; only the proportion of resin dissolved is a little more. By decoction, a considerable amount of pectic acid is removed, as well as resin and fatty matter. It can be inferred from these results, that hot or cold water is appropriate to dissolve the active parts of the gentian, and that it should be employed in the preparation of the extract and the syrup of gentian.

Alcoholic solution. We have seen that strong or weak alcohol completely exhausts the gentian root of its bitterness. For pharmaceutic usage, custom has limited the strength of alcohol to 22°, which will dissolve, it is true, a large number of the principles which are foreign to the bitter substance, which is of little importance. The tincture of gentian contains bitter matter, sugar, gum, the acid principle gentisin, and fatty, resinous, and odorous substances.

Conclusion.

The principal results of my researches, have led me to correct many ideas which chemists have entertained upon the composition of gentian.

1. Gentianin, which was considered as the bitter principle of gentian, contains, on the contrary, but a small proportion of the bitterness of the root. It is composed of gentisin, or an insipid crystalline substance, and variable proportions of fatty, odorous, and bitter matters.

2. The crystalline substance of gentian, which I call gentisin, is a mass destitute of bitterness, in which is found a marked

acid property. I consider it as the colouring matter of the root.

3. The glue of gentian is composed of wax, oil, and caoutchouc.

Journal de Pharmacie.

ART. LVI.—BARK OF STRYCHNOS NUX VOMICA, SOLD IN INDIA FOR THE ROHUN, OR SWIETENIA FEBRIFUGA.

The bark of rohun has for a long time been employed with success in intermittent fever, and it was supposed that it contained quinia. To encourage researches, the Medical Society of Calcutta offered a medal of gold to the individual who should discover the desired substance; and during the following year, Dr. Piddington announced that he had settled the question. (See vols. iv. and v. of *Trans. of Med. and Phys. Society.)* But upon his arrival in India, in December, 1833, Dr. O'Shaugnessy (Professor of Chemistry in the Medical College of Calcutta) having been invited to repeat the experiments, the discovery of Dr. Piddington was not confirmed. A specimen of the pretended quinia was sent to Dr. O'Shaugnessy; a quarter of a grain was given to a cat, and the animal died at the end of an hour and a half, in violent spasms. Numerous experiments were made with the same substance, with the same results. The quinia of Dr. Piddington was nothing else but strychnia; for Dr. Wallich determined the bark from which it was derived to be that of *Strychnos nux vomica.* The false rohun stands in the same light as the false angustura, which, some years back, having been introduced into Europe, produced so many accidents, that the Austrian government and other powers caused to be destroyed all found within their territories.

The following are the characters of the two barks:

Bark of the *Swietenia*, (true rohun,) gray externally, substance red, consistence soft, texture flexible, taste slightly bitter and austere, powder coarse and red, aqueous infusion red, colour of cinchona, not affected by nitric acid.

Bark of the *Strychnos nux vomica*, gray externally, deep brown or black internally, sometimes covered with lichens of a rust colour, friable, taste bitter, insupportable, powder gray, aqueous infusion yellow; the bark assumes a blood red colour when touched with nitric acid.*

* The bark, of which mention is here made, appears to be the false angustura itself, as it presents the same characters. It is, moreover, known, that false angustura is the bark of a *Strychnos* (according to M. Virey,) near to the *S. nux vomica*, if it is not derived from this plant. As to the substance determined by Dr. O'Shaugnessy to be strychnia, it appears to us rather to be brucia, which is more easily confounded, from its appearance, with quinia, than it is likely strychnia would be.

MINUTES OF THE COLLEGE OF PHARMACY.

Stated Meeting, held June 28, 1837.

HENRY TROTH, Vice President, in the chair.

From the minutes of the Board of Trustees, the College is informed, that the following gentlemen were duly elected resident members, viz: CHARLES MOYER, ALEXANDER ARDLEY, and LLEWELLEN HASKILL.

A letter of resignation was received from WILLIAM SCATTERGOOD.

The following committee was appointed to take into consideration the propriety of holding the meetings of the College quarterly, viz: WILLIAM BIDDLE, DILLWYN PARRISH, and CHARLES ELLIS.

September 27.—THOMAS R. F. MITCHELL was duly elected a resident member of the College, at a meeting of the Board of Trustees.

WILLIAM BIDDLE tendered his resignation as a member of the Board of Trustees, which was accepted, and ALGERNON S. ROBERTS elected in his place.

This being the evening of the Semi-Annual Election, the following Trustees were elected, viz:

PETER LEHMAN,	W. W. MOORE,
FRANKLIN R. SMITH,	JACOB BIGONET,
SAMUEL F. TROTH,	RICHARD PRICE,
EDWARD NEEDLES,	Dr. F. BACHE.

November 27.—HENRY TROTH, Vice President, in the chair.

From the minutes of the Board of Trustees, the College is informed of the election to associate membership of LANSING B. SWAN, of Rochester, New York.

The Report of the Committee in relation to an alteration of the laws of this College, so as to diminish the number of meetings during the year, being under consideration, it was resolved to amend the same by inserting Monday, instead of Tuesday.

The Report was then adopted.

The following is the amended form of Sect. 1st, Law 7th.

"The stated meetings of the College, for the transaction of business, shall be held on the last Monday of March, June, September, and December."

An Address delivered by Earl Stanhope, before the London Medical Botanical Society, was received; and on motion, it was resolved, that the same be referred to the Publishing Committee.

NOTICE.

Lest the readers of the Journal should be led into misapprehension as regards the soda fountain described by Mr. Swan, in the last number, they are informed that the inventor has applied for a patent right, securing to himself the advantages of the ingenuity he has exhibited in its construction. Of this we were not aware, when the article was published.

MISCELLANY.

Ointment for the cure of Scabies.—Dr. N. Meyer, of Minden, has made use of the following ointment, in the treatment of this disease:—

℞.	Sulphuris Depurati	℥i.
	Pulv. Radicis Helebori albi.	ʒij.
	Kali Nitrici	gr. x.
	Saponis Nigri	℥i.
	Adipis Suilli	℥iij.
M.	Ut fiat unguentum.	

The patient is placed in a chamber, which, in winter as well as summer, is kept at a temperature equal to 28 to 30° R.; he is put in a warm bath, in which his whole body is rubbed with black soap and coarse woollen cloths, so strongly, that all the pustules which have appeared are rubbed off. He is then put to bed between two blankets, wrapped up in a thick woollen cloak; here he remains for twelve hours; and then, for the first time, he is rubbed over the whole body, near the stove, with the ointment. After having rubbed in this ointment, the patient lays himself, similarly wrapped as before, in his bed; and after twelve hours more, a second rubbing is performed, and again, after another twelve hours, a third and last rubbing is accomplished. After this, having lain for another twelve hours, he is put into a warm bath, in which every trace of the ointment is carefully removed, by rubbing with black soap and woollen cloths.—*Dublin Journal of Medical Science, September*, 1837.

Suppurative Peas.—Issue peas are generally made of orange wood or orris root, but it frequently happens that they are not sufficiently active, and it is desirable to increase their activity. Under these circumstances, cantharides, or epispastic ointments are employed, which are always productive of much suffering. This inconvenience is avoided by the employment of *suppurative peas;* and as their preparation is known but to a few pharmaceutists, I have thought that it would be useful to publish a formula, which for a long period has succeeded well; it is the following:—

Take of Alcoholic extract of the bark of
Daphne Gnidium, ℥i.
Rectified Alcohol, ℥iv.
Dissolve and filter.

Take the orange wood peas from the thread and plunge them for five minutes in the solution, then remove them and allow them to dry in the air. Repeat this twice more, permitting them to dry each time; when completely dry, rub them with a linen rag to restore their shining surface. Place them in bottles, or re-string them.

If they be not detached prior to immersion, they will but imperfectly imbibe the solution; and if allowed to remain in it longer than the time specified, they will swell too much and become irregular. The peas of orris cannot undergo this operation, in consequence of their porosity, which causes them to dilate too much, and lose their spherical form, which should be preserved.

The suppurative peas are useful whenever it is wished to produce abundant suppuration without irritant action. It is sometimes the practice to alternate their use with those ordinarily employed; for example, every two, three, four, or even six hours, or upon alternate days.

Journal de Pharmacie.

Oxalhydric Acid of M. Guerin.—Professor Erdmann, of Leipsic, has made the remarkable discovery, that the particular acid obtained by the treatment of sugar, (oxalhydric acid of M. Guerin, artificial malic acid,) possesses the composition of tartaric acid; if a solution of this acid be allowed to stand a long time, it is transformed into ordinary tartaric acid. All the oxalhydrates are changed into ordinary tartrates; and crystallized oxalhydrate of ammonia, described by M. Guerin, is a pure tartrate of this base. The salts contain upon 2 at. of base 3 (C^4, H^4, O^5.)

A later examination has demonstrated that this acid is identical with the isomeric tartaric acid of M. Braconnot, which is obtained by the fusion of ordinary tartaric acid. M. Liebig had already obtained, long since, clear and well formed crystals of tartaric acid from the acid syrup which remains after the preparation of oxalic acid, by means of sugar and nitric acid, which he allowed to remain a long time by itself. All the anomalies, as to the modes in which the oxalhydrates exist, disappear with this beautiful and important discovery.—*Journal de Pharmacie.*

Iodine in the oleum jecoris ascelli, (oil of the liver of the codfish.)—Dr. Kopp, of Hanua, having for a long time suspected the presence of iodine in this oil, engaged M. Hopfer, of Orme, to determine the fact by experiment. The experiment was made in the following manner:—A pound of the oil possessing a reddish brown colour, was saponified with an excess of a solution of caustic soda. The soap obtained was carbonized, and

the residue lixiviated. Sulphuric acid was added to the solution, but not to complete saturation; after which the sulphate of soda was crystallized, and the mother waters evaporated to dryness. The residuum was placed in a flask with a small quantity of water, and concentrated sulphuric acid was added to it, with a little peroxide of manganese, when a piece of paper, covered with starch and affixed to the stopper, was coloured of a beautiful blue. Another portion of the residuum, treated with starch and nitric acid, also afforded blue iodide of starch.

M. Hansman, of Atens, in Oldenburg, obtained the same result by employing a method a little different, without a knowledge of that of M. Hopfer, of Orme.

Three drachms of clear brown oil of the liver of cod were saponified by a solution of caustic potassa; the soap was carbonized, and the carbonaceous residue lixiviated; the solution was filtered, after there had been added a small quantity of carbonate of ammonia, in order to transform the excess of caustic potassa into a carbonate of potassa; it was then evaporated to dryness. The saline residuum was repeatedly treated with hot alcohol, and the alcohol evaporated. A very small quantity of yellowish-white residuum was thus obtained, which attracted moisture from the atmosphere, and had a slight odour of iodine. This saline residuum was placed in a glass tube, very much contracted at its anterior extremity, such a one as is recommended by M. Wackenroder, for this purpose; (see his Introduction to the Analyse Chemique Qualiquative, p. 369;) then fresh starch was placed in the superior part of the tube. When concentrated sulphuric acid was poured upon it, effervescence took place; and by heating it, there were disengaged violet vapours, which coloured the starch of a deep blue. The examination of another sort of the oil, which was of a clearer yellow, afforded the same result, but less marked. A third sort, of a deep brown, treated in the same manner, appeared, on the contrary, to contain more iodine than the first.

These experiments not only confirm the discovery of M. Hopfer, of Orme, but moreover appear to demonstrate, that the deep coloured oil contains a little more iodine than the light coloured. Moreover, the proportion of this substance in it is always very small, and a quantitative analysis cannot be without interest.

This is the first instance of the presence of iodine in a fatty substance. M. Wackenroder thinks that it must come from the sea water, or else from the substances upon which the animal feeds. A. G. V.

Journal de Pharmacie.

Method of preserving vegetable juices and infusions; proposed by M. Fayard.—MM. Guibourt & Planche, in a report to the Societé de Pharmacie, recommend this plan to the attention of pharmaceutists; it consists "in introducing the fluids into bottles, and closing them by means of a lamina

of caoutchouc tied down upon the neck of the bottle." The plan has been practised by M. Fayard for four years, and the juices thus kept have answered the purposes of those recently prepared equally well.

Journal de Pharmacie.

Glycerine.—M. Pelouse communicated to the Societé de Pharmacie (July, 1836,) the principal results of his investigations upon this principle. He deduces the following:—1. That glycerine readily combines with sulphuric acid, and forms with it an acid, *sulpho glyceric*, analogous to sulphovinic acid, and capable also of forming salts. 2. That this sulpho-glyceric acid contains glycerine in an anhydrous state, and that it can undergo a true saponification, in such a way, that by treating it with a mineral base in excess, a sulpho-glycerate is first obtained, and then a sulphate of the same base; finally, hydrated glycerine, exactly similar to that which is disengaged from fatty bodies during saponification.

M. Pelouse concludes, from these well ascertained facts, that fatty bodies ought henceforward to be considered as true anhydrous salts, with glycerine as their base, which had been conjectured by M. Chevreul.

Journal de Chemie Medicale.

Formula for syrup of codeia, by M. Cap.—The authors of the new codex, not having given the formula for the syrup of codeia, frequently prescribed by some physicians, I have thought it would be useful to publish that which I have followed for several years, as also the method pursued by me in its preparation.

℞. Crystallized codeia,	24 grains.
Distilled water,	4 ounces.
Very white broken down sugar,	8 "

Reduce the codeia to an impalpable powder in a glass or porcelain mortar. Triturate it with a third of the water; allow it to settle, and decant. Act upon the residuum with another third of the water, and then again with the remainder. Reunite the whole in a small mattrass, covering the opening with a piece of moistened parchment pierced with a pin hole. Heat in a salt water bath, until the codeia has entirely disappeared; remove the mattrass from the fire to add the sugar, cover the opening anew, agitate it, plunge it again in the bath, and allow it to remain until the sugar is completely dissolved. Filter the syrup through paper, in a cool situation, and preserve it by the ordinary means.

This method has for its aim, the avoidance of prolonged contact with heat, which would have more than one inconvenience. If the pulverized codeia were solely brought in contact with hot water, it would remain a long time before being dissolved, under the form of oily globules; while on the contrary, when reduced to a very fine powder, it is dissolved at a low

temperature. In the second place, if the sugar be dissolved while the heat is continued, the syrup would be sensibly coloured.

Each ounce of syrup contains two grains of codeia, according to the dose of M. Barbier, of Amiens. *Journal de Pharmacie.*

Means of detecting the presence of farina mixed with fecula.—Several members of the Societe de Chemie Medicale, have been consulted upon the means of detecting the mixture of farina with fecula. It is conceived that the high price of fecula may, at the present time, render this sort of fraud probable, while up to the last year, this mixture could not be supposed but inversely; that is to say, up to this time, the weight of farina was more likely to be increased by adding fecula. If the first falsification was very difficult to discover, the second could doubtless be easily indicated by many methods, and especially by the following:

Prepare a solution containing 1 part, by weight, of pure soda, to 100 parts of distilled water. Weigh out two grammes of the fecula to be tested, mix them with 100 grammes of the alkaline solution, and, at the end of two minutes, add 200 grammes of pure water; agitate in a brine prover, and allow to deposit. If the fecula be without mixture, it will occupy about 100 times the primitive volume of the supernatant water. If it be mixed with farina, the supernatant solution will be more or less clouded and the volume of matter less bulky.

It will be most satisfactory to make each time a comparative trial with pure fecula, as the temperature may alter the effect.

Perhaps this trial can be rendered applicable to mixed farinas, by studying the analagous reactions of divers proportions between fecula and farina—the presence of gluten, albumen, &c., as well as the difference of cohesion and volume of starch, and the fecula of the potato, at least permit us to hope so. *Journal de Chemie Medicale.*

Action of neutral Hydriodate of Potassa upon the Bisulphate of Quinia, and the new compound which results, by M. Righini. In the Bibliotica di Farinacia Chemica, da Antonino Cataneo, for September, 1836, appeared an extract from the experiments of Dr. Inglis upon iodine, in which he demonstrates the action of neutral hydriodate of potassa upon sulphate of quinia. The phenomena, which result from this reaction, have for some time been studied by me, but I have not published them, because I wished to correct my errors. Although Dr. Inglis has witnessed the changes produced by hydriodate of potassa upon sulphate of quinia, yet my more extended experiments have demonstrated, upon analysis, that this chemist has been guided by a false light, in considering the compound resulting from the decomposition of the two salts, as an iodide, although he does not deny, that in the reaction an iodate is formed.

The following are my experiments:

I dissolved twenty-four parts of neutral hydriodate of potassa, and twenty of bisulphate of quinia, each separately, in eight parts of distilled water. The solutions having been filtered, I added, drop by drop, that of the hydriodate into the liquid containing the sulphate. The mixture, after its penetration, acquired a pale yellow tint, which continued during some minutes, when the liquid became coloured, and a saffron yellow colour was developed; by minutely observing these changes, I perceived that at this moment decomposition took place, and a red powder was deposited, similar to that of the carbonate of peroxide of iron. The liquid from which the precipitate was separated, became limpid and devoid of bitterness. I collected the precipitate obtained, and, after having placed it upon a filter, I washed it promptly with distilled water, so as to deprive it of every particle of sulphate of potassa, which by chance might have remained with it; and I dried it in the shade, upon a cloth covered with leaves of bibulous paper.

Explanations of the phenomena which take place in the decomposition and analysis of the compound resulting.

The first direct action, is that of the sulphuric acid combined with the quinia; it acts upon the potassa, and sets the iodine free. This, uniting with a portion of quinia, gives origin to iodide of quinia and sulphate of potassa; but as the acid in the sulphate is in excess, this decomposes a portion of hydriodate still untouched, separates the hydriodic acid, which, by combining with the remaining quinia, forms a sub-hydriodate, which is precipitated, intermixed with iodide.

The theory accords with the analysis of the precipitate, the composition of which I present.

Hydriodic acid,	30
Quinia,	50
Iodine,	20
	100

Physico-chemical properties of the compound.

The taste of this substance is acrid and bitter. It is little soluble in distilled water at the ordinary temperature, but at 60° R. it dissolves completely, and after some time is decomposed, losing its colour, and developing the odour of iodine. The same decomposition takes place when the compound is dissolved in water at the ordinary temperature, but it then requires more time, and the assistance of the atmosphere. It is very soluble in alcohol at 40°, but, by its solution, loses its red colour, and takes that of a pale yellow. Diluted sulphuric acid, dropped into

the solutions, disengages more or less hydriodic acid. The same effects take place with hydratic ether. The capacity of saturation of hydriodic acid for quinia appears to me extremely weak.

Note upon the foregoing, by M. Cherau.

The remarks made by M. Righini, are based upon the observation made by Dr. Inglis, that when neutral hydriodate of potassa is brought into contact with sulphate of quinia, reaction takes place. Without searching into the nature of this reaction, it is to be observed, that it was noticed in France, both by M. Reignier, pharmacien at Collet, Allier, and by M. Pelletier, who has published a memoir upon the action of iodine and its acids upon organic bases. (*See Journal de l'Institut*, 1835, *No.* 147.) The work of M. Reignier, which has not been printed, was addressed to M. d'Arcet in 1836, with a specimen of the product. But this work was forgotten. See what M. Reignier has written upon the subject.

Note upon Iodide of Quinia.

At the commencement of 1835, in making a solution of sulphate of quinia in a porcelain mortar, which had contained hydriodate of potassa, I perceived that an abundant yellow precipitate was formed. I was at no loss to conjecture what had caused this precipitate, and repeated the operation by taking eight grammes of hydriodate of potassa, dissolved in thirty-two grammes of distilled water, slightly acidulated, and mixing the two liquids, I obtained the same yellow precipitate, which I presumed to be the iodate of quinia; but I was, at a later period, convinced that the salts of iodine, when acted upon by acids, lose their action by giving off iodine.

This precipitate being obtained, it is important to know the most prominent characters. These are the result of my researches:

The precipitate, placed to drain upon the paper filter, rapidly passed to red, then to a reddish brown; treated by alcohol at 36°, it was entirely dissolved; submitted to evaporation and crystallization, there were formed in a few hours transparent crystals, of a beautiful yellow colour.

These crystals are quadrangular silky prisms. Exposed to the air, these crystals soon lose their transparency, and finally become reddish yellow.

The iodide of quinia appears to be not only a salt of an organic basis, increasing the number of those made known to us daily, but also a medicinal agent of considerable power in scrofulous diseases, and in the treatment of certain tumours where iodine and the bitters are administered in concert. Already several physicians have commenced to employ it. It is probable that they will derive beneficial results from it in practice.

Journal de Chemie Medicale.

Toxicological effects of Iodide of Lead.—M. Paton, in a note upon iodide of lead, states, that iodine forms combinations, of which the soluble ones are violent poisons, while those which are insoluble or little soluble, are comparatively innocent. Being desirous of knowing to what degree iodide of lead possessed toxicological properties, he prepared it himself in order to secure its purity; he then administered twelve grains to a half grown cat; four hours afterwards, no sensible effect was produced, when he administered twelve grains more; in twelve hours after the administration of this last dose, the animal, without having vomited, appeared uneasy, constantly refused nourishment, appeared to suffer in the region of the kidneys, and avoided the sitting position; finally, it was seized with violent colic, which caused great jactitation, and apparent horrible suffering; and death supervened three days after taking the poison.

The dissection was made twelve hours after, and did not bring to view any trace of irritation; the lungs presented a pale rose-like tint; the stomach was empty, and contained a lumbricus; a single external yellow spot was seen upon the pylorus; the intestines were nearly empty, and contained three tœnias.

To see if it were possible to determine the chemical nature of the poisoning, he examined the interior of the stomach, but could not detect an atom of the poison. He collected the excrements of the animal, and the contents of the intestines, which did not manifest the presence of the least portion of iodide. He boiled these matters in distilled water, the liquid was filtered, then decoloured with carbon, and afforded no change of colour by the action of re-agents. He next boiled the residuum on the filter in water, acidulated with nitric acid, filtered and added a few drops of the solution of chromate of potasssa; a brown precipitate of chromate of lead was formed, mixed with animal substances. The liquid was evaporated, and the product of evaporation calcined in a crucible along with the residuum left by the water. These calcined matters, brought in contact with weak nitric acid, gave rise to an extrication of nitrous gas, and the liquid product afforded, with re-agents, all the phenomena appertaining to soluble salts of lead.

Hence, he concludes, that iodide of lead introduced into the stomach is partly absorbed, and it is this portion which produces death; that the other retained in the intestines can be detected by the afore-mentioned means.—*Journal de Chemie Medicale.*

ERRATA.—Page 307, lines 13 and 29, for "Foster," read *Forster*. Page 316, line 22, for "Eblina," read *Eblana*.